Furbearer
Management Report
of survey-inventory activities
1 July 1997–30 June 2000

Carole Healy, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
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ADF&G

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 1A (5,000 mi^2)

GEOGRAPHIC DESCRIPTION: Unit 1 south of Lemesurier Point, including all areas draining into Behm and Portland Canals, and excluding areas draining into Ernest Sound

BACKGROUND

Furbearer populations have remained at moderate to high population levels in Unit 1A during the past decade. Trapping pressure and harvests fluctuate annually, primarily as a function of weather conditions and changes in fur prices.

More Southeast Alaska trappers are interested in martens than any other furbearer species. Martens are easy to trap, their pelts are easy to care for, and combined income from the pelts is generally greater than for any other furbearer species in southern Southeast Alaska. Marten prices have remained stable at moderate levels throughout the past decade. Extensive logging in much of Unit 1A continues to remove uneven-aged old-growth habitat required by martens. As a result we believe the area's capacity to support marten populations will decline over time.

Southeast Alaska provides excellent habitat for river otters, and fur buyers consider pelts from this area to be high quality. Some trappers report selling Southeast otter pelts to taxidermists because of the demand for the exceptional large body sizes and the high-quality fur. Otter pelt prices were high during the late 1970s, declined during the 1980s and early 1990s, and have increased during the past few seasons. Because otters are difficult to trap and pelt preparation is time consuming, prices must be high to substantially influence harvest levels. Most recently the prices and demand for otter pelts have increased slightly.

Beaver prices have remained stable and low for several years. Beaver harvests can fluctuate dramatically from year to year because of the efforts of a few trappers.

For the past decade mink pelt prices have remained low and stable and resulted in moderate to low interest among trappers. However, some trappers continue to make mink sets while trapping for other furbearers regardless of their current low value.

Wolverines inhabit only the mainland portion of Unit 1A where very few are taken annually. Trappers do not generally target wolverines and harvests tend to be incidental to wolf or marten

trapping. There are no foxes or coyotes in Unit 1A and lynx are only occasionally taken from the 1A mainland. Mountain lions are occasionally observed along the mainland and on the Cleveland Peninsula, but there is currently no open trapping season.

We believe that weasel populations fluctuate from year to year, independent of trapping. Harvest tends to be limited to incidental take while targeting other furbearers, primarily marten. Very few muskrats inhabit Unit 1A and harvests are typically low and incidental to beaver trapping.

Furbearers in Unit 1A by order of their significance to trappers include marten (*Martes americana*), land otter (*Lutra canadensis*), beaver (*Castor canadensis*), mink (*Mustela vison*), wolverine (*Gulo gulo*), lynx (*Lynx canadensis*), weasel (*M. erminea*), red squirrel (*Tamiasciurus hudsonicus*), and flying squirrel (*Glaucomys sabrinus*). Fox and coyote are absent in Unit 1A.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Seal harvested beaver, marten, otter, lynx, and wolverine pelts.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Furbearer harvest data comes from mandatory sealing of marten, beaver, lynx, otter, and wolverine pelts. Mink populations are assessed through staff observations and information obtained through our annual trapper surveys.

Beaver pelts have been sealed for over 23 years. Wolverines were first sealed in 1971 and river otters have been sealed since 1978. Marten sealing was initiated in 1984.

We do not perform furbearer population surveys in Southeast Alaska. Some ecological information is available for mink and river otters from short-term research studies completed in Southeast (Harbo 1958, Home 1977, Larsen 1983, Woolington 1984, Johnson 1985). A study of marten ecology was completed on northeast Chichagof Island (Flynn and Schumacher 1997) and is currently in the writing phase.

RESULTS AND DISCUSSION

POPULATION STATUS AND TRENDS

Marten populations fluctuate annually throughout Southeast Alaska. Fluctuations are likely related to changes in prey abundance. Unit 1A trappers believe martens have remained at moderate to high levels during this report period (Table 1). Discussions with trappers suggest

that martens prefer old-growth stands and avoid clearcuts. We anticipate continued reductions in old-growth habitat will eventually result in reduced marten numbers.

Otter populations were believed to be low in the late 1970s when prices were high (Wood 1990) and after that time prices and trapper interest dropped substantially; only recently has effort recovered. We believe that populations have steadily increased in the past decade and are presently at moderate-to-high levels. This is supported by information obtained from trappers (Table 1). Prices are now higher than during the past few years and consequently more trappers are targeting otter.

Beaver populations have generally remained at moderate levels in Unit 1A (Table 1). Habitat changes can cause large fluctuations in beaver populations (Wood 1990). Although early successional second-growth habitat can support higher populations of beavers than old growth, when the second-growth canopy closes (approximately 20 years post-cutting), beaver numbers drop to low levels. Current pelt prices do not seem high enough to foster much trapping pressure except in easily accessed areas.

Mink populations appear to have remained at extremely abundant levels during this report period (Table 1). Given the current limited interest in mink pelts, we do not expect this to change unless pelt prices increase substantially and promote additional trapping effort.

MORTALITY

Harvest

Seasons and Bag Limits

Unit 1A		
Hunting		
Wolverine	Nov 10–Feb 15	One wolverine
Trapping		
Beaver	Dec 1–May 15	No limit
Lynx, mink, marten, otter, weasel, muskrat	Dec 1–Feb 15	No limit
Wolverine	Nov 10–Apr 30	No limit

Board of Game Actions and Emergency Orders. A public proposal submitted to the Board of Game (Board) during fall 2000 to limit trapping along some of the areas close to Ketchikan and along high use trails was not adopted, and with direction from the Board the department formed a public working group to address the issue. The proposal was submitted after 3 pets were caught in traps during the 1998 trapping season. This working group made a good attempt at reaching consensus among trappers, pet owners, and other user groups. Members of the team were selected from a list of people who submitted comments to the Board on this issue; we attempted to select representatives from each of the user groups. Once the group establishes some guidelines the next step will be to present the recommendations to the public for comments. The group has identified potential mandatory and voluntary changes. As a key concern the group

voted unanimously in favor of a trapping class for anyone wanting to trap in the Ketchikan Borough. This education effort will take a great deal of work to organize and implement.

There were no changes to trapping regulations during this report period.

Trapper Harvest. The past 3-year average of 205 marten was similar to the 10-year mean ($\bar{x}$ =219). An average of 14 trappers caught totals of 198, 196 and 222 martens annually (1997–99). The Unit 1A marten harvest reached its peak during the 1991 season when trappers caught 654 marten, and dropped considerably to a low of 42 marten in 1993.

During each of the past 3 years (1997–1999) an average of 15 trappers sealed 119, 68, and 131 otters, respectively. The 3-year average ($\bar{x}$ =106) is well above the 15-year average ($\bar{x}$ =85). The high of 19 successful otter trappers during the 1999 season was one of the highest on record for Unit 1A compared to an average of 15 trappers during the past 10 years.

The Southeast-wide harvest of 448 beaver during the 1999 season was the highest in recent years and well above the 5-year average of 329. The Unit 1A beaver harvest has also exceeded the long-term average during 2 of the past 3 years of this report period. Trappers caught 36 beaver during both the 1997 and 1999 seasons. During 1998, the harvest dropped by over 50% to 14 beaver, likely because of in-season heavy and persistent snow making travel and trapping difficult. During such a winter it is often too labor intensive to dig through deep snow and chip through ice to make beaver sets. Beavers also become much less active and remain in their lodges or under ice relying on food caches, making them more difficult to catch. The low 1998 harvest can also be attributed to fewer trappers actively targeting beaver. As a result of trapping conditions during the 1998 season only 4 trappers sealed Unit 1A beaver. Ten beaver trappers were successful during 1997, more than during any other year in the last 10. The 10-year average has been 7 successful beaver trappers annually in Unit 1A.

The Unit 1A wolverine harvest has remained low during the past 15 years (range 0–7, $\bar{x}$ =2). During this report period (1997–99) trappers sealed 3, 0, and 1 wolverine, respectively. Wolverines are typically caught incidental to other trapping efforts and are not abundant enough to be a main target species in Unit 1A. Several trappers have reported making wolverine sets only after losing marten to wolverines along established traplines. The 3 wolverine caught in 1997 were taken by 3 separate trappers.

Harvest Chronology. For all species of furbearers trapped in Unit 1A the chronology of the harvest is related more to hide quality than availability of the animals during the trapping season. During this 3-year report period the majority of martens were taken during December (58%), January (28%) and February (14%). The otter harvest followed the same pattern with the majority of harvest during December (47%) and fewer in January (35%) and February (18%). The beaver harvest has been well distributed during this report period; December (27%), January (25%), and February (23%), with fewer taken during March (17%) and April (8%).

Transport Methods. Due in large part to the limited road system in Unit 1A, trappers typically report using boats as the major mode of transportation. The exception is beaver trapping where the use of boats and highway vehicles was more evenly split at 54% and 46%, respectively. Marten trappers reported using boats over 90% and highway vehicles only 5% of the time during

1997–99. Similarly, otter trappers used boats 93% and highway vehicles 6% of the time. Trappers that sealed wolverine hides in Unit 1A used boats exclusively during the past 15 years except during 1990, when snow conditions were ideal and 5 of 7 wolverine harvested were accessed by snowmachines.

Other Mortality

We issued 2 beaver depredation permits to communities and corporations during this report period. Beavers were removed from specified areas in Unit 1A because of flooding and erosion problems.

CONCLUSIONS AND RECOMMENDATIONS

Because furbearer populations in Unit 1A appear to be healthy and thriving we do not anticipate any regulation changes at this time. Management staff will continue to work with the public working group to address issues related to pets caught in traps and snares around Ketchikan. Logging activities permanently remove uneven aged old-growth habitat, replacing it with even-aged, closed canopy habitat that does not meet the requirements of several Southeast Alaska furbearer species. It is therefore important to publicize impacts from land use decisions so that tradeoffs for wildlife can be recognized and understood. The Roadless Initiative passed by Congress in 2000 will protect some prime furbearer habitat in Unit 1A from future logging activities (USDA 2000).

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Table 1 Unit 1A indices of abundance (I_A)[a] for furbearer species[b], 1991–1999

	SPECIES			
REGULATORY YEAR	***BEAVER***	***MARTEN***	***MINK***	***OTTER***
1991/1992	43	73	67	65
1992/1993	25	17	45	54
1993/1994	37	25	42	50
1994/1995	25	25	64	64
1995/1996	75	50	90	80
1996/1997	50	60	70	60
1997/1998	60	68	72	82
1998/1999	45	70	74	65
1999/2000	72	36	68	84
$\bar{x}$	48	47	66	67

[a] Species are considered abundant when $I_A \geq 50$; moderate when $20 < I_A < 50$; and scarce when $I_A \leq 20$. From Brand and Keith (1979).

[b] Values derived from responses to trapper questionnaires.

Table 2 Unit 1A furbearer reported harvests, 1984–1999

Species/regulatory year	Total take	Percent male	Method of take (percent)			Transportation used (percent)				
			Shot	Trapped or snared	Unk	Boat	Road	Air	Unknown	Other[a]
Beaver										
1984/1985	39	--	0	100	0	--	--	--	100	--
1985/1986	20	--	0	100	0	95	5	0	0	0
1986/1987	52	--	0	100	0	45	55	0	0	0
1987/1988	44	--	0	100	0	27	48	0	25	0
1988/1989	24	--	0	100	0	33	67	0	0	0
1989/1990	10	--	0	100	0	60	40	0	0	0
1990/1991	7	--	0	100	0	29	29	0	0	42
1991/1992	46	--	0	100	0	39	39	0	2	20
1992/1993	14	--	0	100	0	43	57	0	0	0
1993/1994	28	--	0	100	0	46	54	0	0	0
1994/1995	19	--	0	100	0	11	42	0	47	0
1995/1996	46	--	--	100	0	7	93	0	0	0
1996/1997	24	--	--	100	0	33	46	0	0	21
1997/1998	36	--	--	100	0	69	31	0	0	0
1998/1999	14[c]	--	--	57	43	21	36	0	43	0
1999/2000	36	--	--	97	43	42	47	0	3	8
Marten										
1984/1985	203	69	0	100	0	--	--	--	100	--
1985/1986	156	63	0	100	0	--	--	--	100	--
1986/1987	127	66	0	100	0	94	6	0	0	0
1987/1988	313	69	0	100	0	84	16	0	0	0
1988/1989	490	59	0	100	0	84	16	0	0	0
1989/1990	246	70	0	100	0	89	11	0	0	0
1990/1991	261	65	0	100	0	71	15	1	0	13
1991/1992	654	62	0	100	0	91	9	0	0	0
1992/1993	122	71	0	100	0	97	3	0	0	0
1993/1994	42	74	0	100	0	95	5	0	0	0
1994/1995	143	66	0	100	0	85	15	0	0	0
1995/1996	134	64	0	100	0	98	2	0	0	0
1996/1997	220	64	0	100	0	78	13	0	0	9

Table 2 Continued

Species/regulatory year	Total take	Percent male	Method of take (percent)			Transportation used (percent)				
			Shot	Trapped or snared	Unk	Boat	Road	Air	Unknown	Other[a]
1997/1998	198	64	0	100	0	84	3	0	0	13
1998/1999	196	65	0	100	0	90	8	0	0	2
1999/2000	222	61	0	100	0	95	5	0	0	0
Otter										
1984/1985	65	63	1	99	0	--	--	--	100	0
1985/1986	70	71	7	93	0	63	0	0	37	0
1986/1987	63	62	11	89	0	91	5	4	0	0
1987/1988	88	61	9	91	0	81	5	4	10	0
1988/1989	45	78	40	60	0	71	11	0	18	0
1989/1990	81	72	18	82	0	90	10	0	0	0
1990/1991	80	59	10	90	0	98	2	0	0	0
1991/1992	84	55	19	81	0	89	11	0	0	0
1992/1993	61	57	13	87	0	80	18	0	2	0
1993/1994	112	62	11	89	0	97	3	0	0	0
1994/1995	129	51	18	82	0	96	3	0	0	1
1995/1996	65	66	23	75	2	77	11	0	0	12
1996/1997	104	55	20	80	0	90	9	1	0	0
1997/1998	119	59	14	86	0	94	6	0	0	0
1998/1999	68	60	9	91	0	96	3	0	1	0
1999/2000	131	56	27	73	0	89	10	0	0	1
Wolverine										
1984/1985	1	100	100	0	0	100	0	0	0	0
1985/1986	0	--	--	--	--	0	0	0	0	0
1986/1987	2	100	0	100	0	100	0	0	0	0
1987/1988	1	0	0	100	0	100	0	0	0	0
1988/1989	0	--	--	--	--	0	0	0	0	0
1989/1990	1	100	0	100	0	100	0	0	0	0
1990/1991	7	71	14	86	0	29	0	0	0	71[b]
1991/1992	1	0	0	100	0	100	0	0	0	0
1992/1993	2	0	0	100	0	100	0	0	0	0
1993/1994	1	100	0	100	0	100	0	0	0	0

Table 2 Continued

Species/regulatory year	Total take	Percent male	Method of take (percent)			Transportation used (percent)				
			Shot	Trapped or snared	Unk	Boat	Road	Air	Unknown	Other[a]
1994/1995	5	100	0	100	0	100	0	0	0	0
1995/1996	0	--	--	--	--	0	0	0	0	0
1996/1997	3	100	0	100	0	100	0	0	0	0
1997/1998	3	67	0	100	0	33	0	0	0	67
1998/1999	0	0	0	0	0	0	0	0	0	0
1999/2000	1	100	0	100	0	100	0	0	0	0

[a] Includes trappers who hike or use snowmachines.

[b] Trappers using snowmachines took 5 of 7 wolverines.

[c] One beaver killed by vehicle.

Table 3 Unit 1A furbearer harvest chronology by month, 1984–1999

Species/regulatory year	Harvest periods							Successful trappers/hunters
	Dec	Jan	Feb	Mar	Apr	May	Unk	
Beaver								
1984/1985	1	11	8	5	11	3	0	--
1985/1986	0	1	11	6	2	0	0	--
1986/1987	15	8	12	9	4	4	0	11
1987/1988	16	0	0	11	1	3	13	11
1988/1989	12	4	0	8	0	0	0	5
1989/1990	3	2	1	0	4	0	0	5
1990/1991	0	0	4	3	0	0	0	5
1991/1992	17	11	5	4	8	0	1[a]	9
1992/1993	7	2	2	1	2	0	0	9
1993/1994	10	5	3	6	4	0	0	7
1994/1995	2	0	12	1	4	0	0	3
1995/1996	0	0	7	3	16	12	8	8
1996/1997	0	5	4	7	2	6	0	6
1997/1998	7	7	10	4	2	0	6	10
1998/1999	4	5	2	1	0	0	2	4
1999/2000	10	7	6	8	4	0	1	9
Marten								
1984/1985	118	68	17	0	0	0	0	--
1985/1986	107	5	2	0	0	0	42	--
1986/1987	49	65	13	0	0	0	0	14
1987/1988	61	74	7	0	0	0	171	15
1988/1989	95	43	2	0	0	0	350	21
1989/1990	73	80	75	0	0	0	18	16
1990/1991	115	43	10	1	0	0	92	17
1991/1992	215	111	149	0	0	0	179	22
1992/1993	24	93	5	0	0	0	0	12
1993/1994	15	14	1	0	0	0	12	7
1994/1995	81	39	23	0	0	0	0	10
1995/1996	15	34	7	0	0	0	78	10
1996/1997	107	69	44	0	0	0	0	11
1997/1998	97	63	34	4	0	0	0	15
1998/1999	90	65	41	0	0	0	0	13
1999/2000	171	42	9	0	0	0	0	15
Otter								
1984/1985	24	37	2	0	0	0	2	--
1985/1986	27	30	13	0	0	0	0	--
1986/1987	29	26	8	0	0	0	0	13
1987/1988	42	40	6	0	0	0	0	14
1988/1989	8	20	17	0	0	0	0	12
1989/1990	19	40	22	0	0	0	0	12
1990/1991	36	34	10	0	0	0	0	14
1991/1992	31	39	14	0	0	0	0	14
1992/1993	27	27	6	0	1	0	0	12
1993/1994	64	38	10	0	0	0	0	15
1994/1995	78	37	13	0	0	0	1	19
1995/1996	33	21	11	0	0	0	0	14

Table 3 Continued

Species/regulatory year	Harvest periods							Successful trappers/hunters
	Dec	Jan	Feb	Mar	Apr	May	Unk	
1996/1997	35	28	41	0	0	0	0	13
1997/1998	61	40	18	0	0	0	0	16
1998/1999	27	22	19	0	0	0	0	11
1999/2000	61	50	20	0	0	0	0	18
Wolverine								
1984/1985	1	0	0	0	0	0	0	--
1985/1986	--	--	--	--	--	--	--	--
1986/1987	0	2	0	0	0	0	0	1
1987/1988	1	0	0	0	0	0	0	1
1988/1989	--	--	--	--	--	--	--	0
1989/1990	0	0	0	0	1	0	0	1
1990/1991	1	5	0	1	0	0	0	3
1991/1992	0	1	0	0	0	0	0	1
1992/1993	0	1	0	0	1	0	0	2
1993/1994	0	1	0	0	0	0	0	1
1994/1995	0	0	2	1	2	0	0	4
1995/1996	--	--	--	--	--	--	--	0
1996/1997	0	0	0	2	1	0	0	2
1997/1998	2	0	0	1	0	0	0	3
1998/1999	0	0	0	0	0	0	0	0
1999/2000	0	0	1	0	0	0	0	1

[a] One beaver was taken by ADF&G during the month of August.

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 1B (3,000 MI2)

GEOGRAPHIC DESCRIPTION: Southeast Alaska mainland from Cape Fanshaw to Lemesurier Point

BACKGROUND

Except for a few isolated homesteads and cabins, no large communities exist on the Unit 1B mainland, so most trapping pressure comes from residents of Petersburg, Wrangell, and Meyers Chuck. Because trappers from these communities must cross open water to access mainland traplines, access is largely restricted to boats. As a result, trapping pressure and harvest fluctuates annually and are influenced by both weather and changes in fur prices. In the Stikine River drainage, snowfall and the timing and duration of freeze-up can greatly influence access, trapping pressure, and harvest.

The combined income from marten pelts is generally greater than from any other furbearer species in Southeast Alaska. Accordingly, martens are the most important furbearer species in Unit 1B. Marten populations tend to fluctuate widely in response to both prey abundance and trapping pressure. Pelt prices for martens have remained consistent at moderate levels through the past decade and the marten harvest has remained relatively high during this report period.

While wolverines are occasionally harvested on Mitkof Island in Unit 3, the vast majority of wolverines harvested in the central Southeast panhandle are taken on the Unit 1B mainland. The wolverine harvest has remained stable at moderate levels during the past decade, except for 1999 when the harvest of 18 animals was twice the 9-year average.

With the exception of 1996 and 1997, the beaver harvest has remained very low for the past decade. Access is limited in Unit 1B and traditionally just 1 to 3 trappers per year target beavers.

Land otters are common in along the protected coastal areas and inland waters of Unit 1B. Otter populations fluctuate in response to trapping effort, harvest, and fur prices. With the exception of 1997, the otter harvest declined during this report period.

Although lynx have been documented in Unit 1B, they are considered scarce. No lynx harvest was reported during this report period.

Past declines in some wild furbearer populations prompted regulations. In 1913 beaver trapping was prohibited for 5 years with a renewal extending the closure another 5 years. Martens were protected for 5 years starting in 1915.

Most furbearer trapping is used as a winter income supplement and as a form of recreation. Seasons and bag limits have remained unchanged in recent years.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Seal beaver, marten, otter, lynx, and wolverine pelts as they are presented for sealing.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Harvest information for beavers, lynx, martens, otters, and wolverines is collected from mandatory sealing. Location, harvest date, trapping and transportation method, and sex of all species except beavers are recorded on sealing certificates. We measure pelt size on beavers and otters, which provides an indication of harvested animals' ages. Additional harvest information on furbearer species is reported on fur export reports and fur acquisition reports.

Methods for estimating furbearer population abundance, trends, and distribution include Alaska trapper questionnaires local trappers received during the report period; interviews with trappers and fur buyers; and field observations by ADF&G and Forest Service personnel.

The video "Alaska Guide to Fur Handling" was distributed to local trappers in an effort to maximize the dollar value of their furs through proper skinning and pelt preparation techniques.

We monitored logging operations, road construction, and other developments to assess potential habitat loss.

RESULTS AND DISCUSSION

POPULATION STATUS AND TRENDS

No formal field surveys were conducted in this unit to determine furbearer population status or trends. Information obtained from the trapper questionnaire and biologists' field observations provides our best indication of status and trends (Table 1).Trappers reported that beavers are abundant and stable throughout available habitat in Unit 1B.

Lynx occur infrequently, perhaps as Gray (1915) and others believed, they are more likely to move into the area when snowshoe hares become scarce in the interior of British Columbia.

While lynx may occur in some larger drainages of Unit 1B, no harvest has been reported in recent years.

Trappers reported martens were common, but felt that populations decreased in 1996/97. In 1997/98 they reported martens abundant with numbers declining. In 1998/99 trappers reported marten abundant and stable.

Mink populations were reported to be abundant and stable during this report period.

Land otter populations were reported to be abundant and stable in 1996/97, common and declining in 1997/98, and common and stable in 1998/99.

Wolverines remained at a low but stable density with trappers reporting in 1998/99 that the population appeared to be increasing.

MORTALITY

Seasons and Bag Limits

Hunting

Wolverine	Nov 10–Apr 30	One Wolverine

Trapping

Beaver	Dec 1–May 15	No Limit
Lynx, marten, mink, otter	Dec 1–Feb 15	No Limit
Wolverine	Nov 10–Apr 30	No Limit

Board of Game Actions and Emergency Orders. No Board of Game actions occurred and no emergency orders were issued during this report period.

Trapper Harvest. Prior to 1996, when 40 beaver were harvested, there had been almost no beaver trapping effort in Unit 1B (Table 2). Two trappers reported taking 16 beavers in 1997/98. No beavers were harvested in 1998/99. Two trappers harvested 4 beavers in 1999/00. During this report period the marten harvest was well above the 9-year mean of 223/year and increased substantially from a low of 74 in 1995, to 340, 365, and 353 in 1997, 1998, and 1999, respectively (Table 3). Unit 1B had an otter harvest of 30, 13, and 13 during the 1997, 1998, and 1999 seasons, respectively (Table 4). The number of wolverines harvested was 8, 9, and 18 in 1997, 1998, and 1999, respectively (Table 5). The harvest of 18 wolverines in 1999 was well above the 9-year mean of 8 per year. One trapper was responsible for harvesting 6 of 18 wolverine taken in Unit 1B in 1999. Heavy snowfall during the winter of 1998/99 hampered trapper access and made it difficult to keep traps functioning. A resulting increase in deer mortality may have increased food availability for wolverines, improved survival, and enhanced reproduction the following spring. These factors probably contributed to relatively high wolverine harvest reported in 1999.

Harvest level is directly related to fur prices and winter weather conditions during the trapping season. Mink and beaver pelt values have been low in recent years. According to fur buyer Dean Wilson, Southeast martens vary widely in quality and color and bring lower prices than interior martens. The market favors Southeastern otters, however, because of their larger size, good color, and silky fur. The Oriental market has been particularly interested in land otters in recent years and prices have increased.

Harvest Chronology. Most furbearer harvest in Unit 1B takes place in January and December, although a substantial portion of the beaver harvest can occur during February and March (Tables 6–9).

Transport Methods. Most beaver and marten trapping areas in Unit 1B are accessed by boat and snowmachine (Tables 10-11).

CONCLUSIONS AND RECOMMENDATIONS

Most furbearer populations appear to be abundant or common and remain stable in suitable habitat. Trapping effort is moderate, reflecting the current low to moderate fur prices. Harvest is well below sustained yield potentials. Large areas of non-coastal habitat on the mainland and islands remain untrapped and continue to provide refuge for furbearers.

I recommend no regulation changes at this time. All land development plans should be reviewed and commented on regarding effects to furbearer populations and trappers. ADF&G can maximize the value of the resource by working with local trappers through the Hunter and Trapper Education Programs.

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Please cite any information taken from this section, and reference as:

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Table 1 Results from trappers questionnaire, Unit 1B

	1996/97 Petersburg, Wrangell, Kupreanof & vicinity		1997/98 Petersburg, Wrangell, Kupreanof & vicinity		1998/99 Petersburg, Wrangell, Kupreanof & vicinity	
Furbearer species	Relative abundance	Trend	Relative abundance	Trend	Relative abundance	Trend
Beaver	abundant	same	abundant	fewer	abundant	same
Ermine	abundant	same	common	fewer	abundant	same
Lynx			x	x	scarce	same
Marten	common	fewer	abundant	fewer	abundant	same
Mink	abundant	same	abundant	fewer	abundant	same
Muskrat	scarce	same	scarce	same	scarce	same
Red Squirrel	abundant	same	abundant	fewer	abundant	more
River Otter	abundant	same	common	fewer	common	same
Wolf	abundant	same	abundant	fewer	abundant	same
Wolverine	scarce	same	scarce	fewer	common	more
Prey species						
Grouse	common	same	common	fewer	common	same
Ptarmigan	common	same	scarce	fewer	scarce	same
Mice/Rodents	abundant	same	abundant	fewer	abundant	same

Table 2 Unit 1B beaver harvest, 1991–1999

		Method of Take		
Regulatory year	Reported harvest	Trap/snare	Unknown	Successful trappers
1991/92	0	0	0	0
1992/93	0	0	0	0
1993/94	3	3	0	3
1994/95	1	1	0	1
1995/96	1	0	1	1
1996/97	40	40	0	2
1997/98	16	16	0	2
1998/99	0	0	0	0
1999/00	4	4	0	2

Table 3 Unit 1B marten harvest, 1991–1999

Regulatory year	Reported harvest						Successful
	M	(%)	F	(%)	Unk.	Total	trappers
1991/92	266	(73)	97	(27)	0	363	10
1992/93	31	(63)	18	(37)	0	49	2
1993/94	92	(61)	57	(38)	3	152	6
1994/95	59	(73)	21	(27)	0	80	5
1995/96	56	(76)	17	(23)	1	74	6
1996/97	137	(58)	65	(27)	33	235	7
1997/98	143	(42)	74	(21)	123	340	10
1998/99	176	(48)	84	(23)	105	365	11
1999/00	209	(59)	137	(38)	7	353	10

Table 4 Unit 1B land otter harvest, 1991–1999

Regulatory year	Reported harvest						Method of take					
	M	%	F	%	Unk.	Total	Trap/snare	%	Shot	%	Unk.	Successful trappers
1991/92	0	(0)	0	(0)	0	0	0	(0)	0	(0)	0	0
1992/93	15	(88)	2	(12)	0	17	17	(0)	0	(0)	0	3
1993/94	14	(67)	7	(33)	0	21	19	(90)	2	(10)	0	6
1994/95	14	(54)	12	(46)	0	26	20	(77)	6	(23)	0	8
1995/96	2	(50)	2	(50)	0	4	4	(100)	0	(0)	0	2
1996/97	8	(33)	16	(67)	0	24	22	(91)	2	(9)	0	4
1997/98	14	(46)	9	(30)	7	30	28	(93)	2	(7)	0	6
1998/99	4	(31)	8	(62)	1	13	8	(62)	5	(38)	0	6
1999/00	10	(77)	3	(23)	0	13	8	(62)	5	(38)	0	4

Table 5 Unit 1B wolverine harvest, 1991–1999

Regulatory year	Reported harvest						Method of take				Successful trappers
	M	%	F	%	Unk.	Total	Trap/Snare	%	Shot	%	
1991/92	4	(67)	2	(33)	0	6	6	(100)	0	(0)	3
1992/93	4	(57)	3	(43)	0	7	7	(100)	0	(0)	1
1993/94	6	(86)	1	(14)	0	7	7	(100)	0	(0)	4
1994/95	8	(100)	0	(0)	0	8	8	(100)	0	(0)	5
1995/96	1	(100)	0	(0)	0	1	1	(100)	0	(0)	1
1996/97	6	(60)	4	(40)	0	10	10	(100)	0	(0)	5
1997/98	5	(63)	3	(37)	0	8	8	(100)	0	(0)	6
1998/99	4	(44)	5	(56)	0	9	9	(100)	0	(0)	2
1999/00	7	(39)	11	(61)	0	18	18	(100)	0	(0)	7

Table 6 Unit 1B beaver harvest, chronology by month, 1991–1999

Regulatory year	Month								
	October[a]	November	December	January	February	March	April	May	n
1991/92	0	0	0	0	0	0	0	0	0
1992/93	0	0	0	0	0	0	0	0	0
1993/94	0	0	3	0	0	0	0	0	3
1994/95	0	0	0	0	0	1	0	0	1
1995/96	1	0	0	0	0	0	0	0	1
1996/97	0	0	8	0	8	24	0	0	40
1997/98	0	0	13	0	3	0	0	0	16
1998/99	0	0	0	0	0	0	0	0	0
1999/00	0	0	4	0	0	0	0	0	4

[a] FS took 1 beaver that was damming a fish ladder.

Table 7 Unit 1B marten harvest, chronology by month, 1991–1999

Regulatory year	Month			
	December	January	February	n
1991/92	117	185	61	363
1992/93	20	29	0	49
1993/94	98	54	0	152
1994/95	64	16	0	80
1995/96	50	21	3	74
1996/97	128	101	6	235
1997/98	130	187	23	340
1998/99	249	114	2	365
1999/00	51	295	7	353

Table 8 Unit 1B otter harvest, chronology by month, 1991–1999

Regulatory year	Month				n
	December	January	February	Unk.	
1991/92	0	0	0	0	0
1992/93	4	5	8	0	17
1993/94	6	14	1	0	21
1994/95	9	9	4	4	26
1995/96	0	2	2	0	4
1996/97	12	2	10	0	24
1997/98	10	19	1	0	30
1998/99	3	9	1	0	13
1999/00	7	6	0	0	13

Table 9 Unit 1B wolverine harvest, chronology by month, 1991–1999

Regulatory year	Month						
	November	December	January	February	March	April	n
1991/92	0	0	3	3	0	0	6
1992/93	0	3	4	0	0	0	7
1993/94	1	3	3	0	0	0	7
1994/95	0	4	3	1	0	0	8
1995/96	0	0	0	1	0	0	1
1996/97	0	3	5	0	1	1	10
1997/98	0	1	5	2	0	0	8
1998/99	6	2	0	0	1	0	9
1999/00	0	0	14	2	1	1	18

Table 10 Unit 1B beaver harvest, method of transportation, 1991–1999

Regulatory year	Boat	3-wheeler	Highway	Skis/snowshoes	Snowmachine	Unknown	Total
1991/92	0	0	0	0	0	0	0
1992/93	0	0	0	0	0	0	0
1993/94	0	3	0	0	0	0	3
1994/95	1	0	0	0	0	0	1
1995/96	0	0	0	0	0	1	1
1996/97	40	0	0	0	0	0	40
1997/98	8	0	0	0	8	0	16
1998/99	0	0	0	0	0	0	0
1999/00	3	0	0	1	0	0	4

Table 11 Unit 1B marten harvest, method of transportation, 1991–1999

Regulatory year	Boat	3-wheeler	Snowmachine	Highway	Skis/snowshoes	Total
1991/92	202	0	140	0	21	363
1992/93	7	0	42	9	0	49
1993/94	75	68	0	9	0	152
1994/95	67	0	13	0	0	80
1995/96	74	0	0	0	0	74
1996/97	69	17	112	37	0	235
1997/98	239	0	97	4	0	340
1998/99	210	60	89	6	0	365
1999/00	262	0	0	0	91	353

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 1C (7,600 mi^2)

GEOGRAPHICAL DESCRIPTION: That portion of the Southeast Alaska mainland from Cape Fanshaw to the latitude of Eldred Rock, including Sullivan Island and the drainages of Berners Bay

BACKGROUND

Martens, mink, otters, and beavers make up the majority of the Unit 1C furbearer harvest. Smaller numbers of wolverines, weasels, and an occasional fisher are taken each year.

Beavers exist at moderate levels in most drainages along the coastal mainland where habitat is suitable. There is limited natural or human-caused disturbance affecting beaver habitat in this subunit. Berners Bay, Taku River, Herbert/Eagle River system, Cowee Creek, St. James Bay, Shelter Island, and Lincoln Island contribute to the total harvest. Few beavers have been sighted on Douglas Island. Although the beaver harvest varies annually, this variation seems related more to trapper effort than to the abundance of beavers.

River otters are fairly common along the mainland coast and most large islands in the unit. While little is known about otter populations, they are thought to be most abundant in sheltered waters provided by bays and inlets.

Martens are common throughout Unit 1C mainland drainages, but are not found on most islands. The exception is Douglas Island, which has an occasional marten present.

Wolverines occur in small numbers, and the sealing information provides little insight into population status or distribution. While wolverines are one of the least common species in the subunit, the high pelt price encourages trappers to target them. Most wolverines are captured in Berners Bay or on the west side of Lynn Canal. Both of these areas are remote from the Juneau road system.

During the report period there were 2 fishers trapped and brought to ADF&G. Both animals were captured on the mainland in marten sets. The first fisher ever recorded in the Juneau area was captured in 1996, and it appears that there may now be a small population in the area.

Coyotes, though once scarce to non-existent in this subunit, are now becoming common near Gustavus and in the foothills of the Chilkat Mountains. Residents of Gustavus routinely hear

coyotes, and trappers have begun catching them in areas where they were not present in past years. There have even been several reported sightings near the Mendenhall Glacier Visitor Center during this report period. The presence of coyotes seems to coincide with the increase in lynx numbers and may well be a response to an increase in snowshoe hares.

Little information exists for mink since trappers are not required to seal them. Anecdotal information indicates that mink are abundant.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Regulate seasons and bag limits to maintain viewable and harvestable populations of furbearers.

2. Seal harvested beaver, marten, otter, lynx, and wolverine pelts as they are presented for sealing.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Mandatory sealing of martens, beavers, otters, wolverines, and lynx was the chief source of furbearer harvest data. For each species we recorded method and month of take, transportation means, and harvest location. Sex and pelt size was recorded for each otter, pelt size was recorded for each beaver, and sex was recorded for wolverines and martens. Trapper interviews and a mail out trapper survey provided additional insight into perceived population status and trapping pressure.

Infrared activated cameras were put afield in 1998 and 1999 in an attempt to record the presence of fishers. These cameras were located near Bessie Creek and Sheep Creek, but no fishers were detected. We are planning to continue these efforts during the next report period.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Unit 1C furbearer populations appear to be stable, based on trapper interviews, mail-out trapper surveys, and harvest data. Lynx remain uncommon, while otters, mink, and martens are common or abundant. Wolverines are present in low densities and found in remote sites. Coyotes are present in low-to-moderate numbers on the west side of Lynn Canal and near Gustavus. Fishers may be gaining a foothold in the area, but we have only the occasional errant capture to provide us with information about this species presence.

Mortality

Harvest

Seasons and Bag Limits

Hunting

Marten, otter, mink, beaver, lynx	No Open Season	
Wolverine	Nov 10–Feb 15	One

Trapping

Marten, otter, mink, lynx	Dec 1–Feb 15	No limit
Beaver	Dec 1–May 15	No limit
Wolverine	Nov 10–Apr 30	No limit

Board of Game Actions and Emergency Orders. No Board of Game actions occurred and no emergency orders were issued during this report period.

Trapper Harvest. The number of beavers harvested during the period fluctuated from a high of 62 in 1997 to a low of 7 in 1998, and in 1999 the harvest was back up to 36. The low harvest in 1998 was likely due to the heavy snowfall that discouraged many trappers from pursuing beavers. In spite of the low 1998 harvest, the mean harvest of 35 beavers per season during this report period compares favorably against the mean of 28 for the previous 10 years. Much of the beaver harvest during this period is attributed to one trapper. Beavers are at times considered a nuisance because of their causing flooding in some residential areas as well as plugging culverts resulting in road problems for the Department of Transportation. During each of the past 3 years we issued 2–3 permits under 5 AAC 92.041 (permit to take beavers to control damage to property).

The river otter harvest declined throughout the report period from 20 in 1997 to 12 in 1998 and only 6 in 1999. Cars killed 4 otters. Conversations with trappers gave no indications that otters were less abundant, so lack of trapper effort probably affected harvest.

The mean annual harvest of wolverines during this report period was 5, nearly identical to the mean annual harvest of 5.6 during the 2 previous report periods. Based on information provided by trappers, wolverines are present in most of the upper reaches of the drainages crossed by the Juneau road system, but most abundant in Berners Bay and on the west side of Lynn Canal.

The marten harvest declined from a mean annual take of 248 during the previous report period to 201 during this report period. This is below the harvest level characteristic of the unit through the late 1980s and most of the 1990s. The percent males in the harvest ranged from 70% in 1997 to 57% in both 1998 and 1999. The lower percentage of male marten in the harvest during the

past 2 years may be an indication of a declining marten population. We believe the trapping effort during the period was within the population's capabilities.

Harvest Chronology. Most furbearers, with the exception of beavers, were caught during December and January. Beavers were caught throughout the trapping season, with the majority caught in April when the days are longer and the weather is better.

Table 3 shows the chronology of the marten harvest during this report period. In 1997 and 1999 the harvest was almost evenly divided between December and January. In 1998 however, the bulk of the harvest occurred in December.

Transport Method. Most Unit 1C trapping takes place adjacent to the Juneau road system, thereby allowing trappers access to areas with highway vehicles. In some cases as in Gustavus, trappers begin hiking from their homesteads. Also, during most winters at least one trapper takes a boat to Berners Bay, Pt. Couverdon, or St. James Bay and drops off a snowmobile or 4-wheeler for locomotion.

CONCLUSIONS AND RECOMMENDATIONS

Unit 1C furbearer populations appear to be healthy and capable of withstanding the present level of trapping pressure. The marten harvest will likely decline during the early part of the next report period based on the percentage of females in the harvest during 1998 and 1999. A single fisher was trapped in each year from 1996–1998, but none were reported harvested in 1999. There has been some discussion about the status of fishers and the lack of a season for this species. One trapper who captured a fisher in 1998 was displeased that he had to give the animal to the state. Presently there is no plan to open a fisher trapping season in Southeast Alaska.

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Table 1 Unit 1C furbearer harvest, 1986–1999

Regulatory year	Beavers	Lynx	Martens	Otters	Wolverines
1986/1987	107	0	241	31	9
1987/1988	47	0	314	55	8
1988/1989	5	0	209	19	10
1989/1990	35	0	256	31	7
1990/1991	15	0	240	36	5
1991/1992	11	0	193	12	8
1992/1993	21	1	73	12	2
1993/1994	25	5	44	13	6
1994/1995	10	1	190	26	9
1995/1996	26	0	262	16	4
1996/1997	17	0	293	19	3
1997/1998	62	0	181	21	5
1998/1999	7	0	267	12	6
1999/2000	36	0	155	6	4

Table 2 Unit 1C marten harvest chronology by sex, 1994–1999

	1994/1995				1995/1996				1996/1997			
Month	Males	%	Females	%	Males	%	Females	%	Males	%	Females	%
November	0	0	0	0	1	100	0	100	0	0	0	0.0
December	76	72	30	28	78	53	69	47	129	63	76	37
January	41	66	21	34	69	62	42	38	55	71	22	29
February	13	59	8	36	1	50	1	50	5	45	5	45
Unknown	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	130	68	59	31	149	57	112	43	189	65	103	35

	1997/1998				1998/1999				1999/2000			
Month	Males	%	Females	%	Males	%	Females	%	Males	%	Females	%
November	0	0	0	0	0	0	0	0	0	0	0	0
December	67	71	28	29	95	61	60	39	35	61	22	39
January	58	68	27	32	47	55	39	45	40	62	25	38
February	1	100	0	0	10	38	16	62	13	39	20	61
Unknown	0	0	0	0					0	0	0	0
Total	126	70	55	30	152	57	115	43	88	53	67	47

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 1D (2,700 mi^2)

GEOGRAPHIC DESCRIPTION: That portion of the Southeast Alaska mainland lying north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay

BACKGROUND

Trapping in Unit 1D may be limited by the difficult access to many areas prior to river freeze up. The Chilkat River provides a transportation corridor once it freezes, but solid ice and enough snow for travelling by snowmachine often aren't present until December. This limits the areas trappers can access. With limited marine shoreline compared to other Southeast Alaska units, land otters and mink habitat is not as prevalent or as productive as in other areas. In spite of this the Chilkat River and its tributaries support a fair number of these species. Beavers, though once scarce, are now quite common throughout the unit. The lynx population varies from almost no animals to abundance, depending on the number of lynx and snowshoe hares in neighboring Canadian areas. Mountainous terrain in the subunit provides extensive wolverine habitat and the scavenging opportunities on wolf-killed moose and goats probably provides ample foraging opportunities. We have little information on the wolverine population in this unit. Late season salmon runs provide food for many furbearers throughout the winter.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Seal harvested beaver, marten, otter, lynx, and wolverine pelts as they are presented for sealing.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Mandatory sealing of martens, otters, wolverines, and lynx has provided the best source of data on furbearer harvests. For each species, the method and month of take and type of transportation were recorded. Sex composition of the marten harvest was noted. Sex and pelt size (used to differentiate adults and young) were recorded for otters and beavers. Trapper questionnaires provided additional insight into perceived population status and trapping pressure.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

The average annual harvest of 65 martens captured during this reporting period is substantially lower than the 99 and 108 marten caught in 1995 and 1996, respectively. It is unclear whether this trend is due to a change in marten density or a change in trapping effort. Heavy snows in 1999 may have excluded trappers from some areas of the unit, resulting in a lower catch. The high proportion of males in the harvest throughout this reporting period indicates a healthy and productive marten population.

Wolverine harvest decreased to less than 1.6 animals per year during this report period. This is a dramatic decrease from the previous 2 periods when the mean annual harvest was greater than 6. It is likely that decreased trapper effort is responsible for this difference, because during the years of high harvest 2 trappers were responsible for most of the wolverine catch. During this reporting period neither of these trappers was active. Because of extensive suitable habitat, the wolverine population is probably stable at low numbers.

No lynx were trapped during this report period, probably reflecting low densities typical in this unit. These animals were relatively common and easy to catch in the early 1990s, as the prey base in adjacent Canadian areas declined and lynx immigrated into the unit in search of food. It is unknown whether the lynx population was high or low in Canada during this report period.

Land otter harvests remained low, similar to levels experienced during the previous five years. The population appears to be healthy and widespread based on the abundance of otter tracks seen while flying winter moose surveys.

Sixteen beavers were trapped under 5 AAC 92.041 (permit to take beavers to control damage to property). The Division of Wildlife Conservation staff received complaints of beavers flooding several roads as well as negatively affecting aquaculture projects. Several nuisance permits were issued during this report period. Beavers have increased in number over the past 20 years, prompting the Department of Fish and Game to submit a proposal to the Board of Game in fall 2000. The Board adopted the proposal that will allow a trapping season beginning in the fall of 2001. The beaver season had been closed since 1976 due to low numbers.

MORTALITY

Harvest

Seasons and Bag Limits.

Hunting

Marten, otter, mink, lynx, beaver	No open season	
Wolverine	Nov 10–Feb 15	One

Trapping

Beaver	No open season	
Marten, otter, lynx	Dec 1–Feb 15	No limit
Mink, wolverine	Nov 10–Apr 30	No limit

Board of Game Actions and Emergency Orders. No Board of Game actions occurred and no emergency orders were issued during this report period.

Trapper Harvest. Table 1 lists trapper harvest for the report period. The lynx harvest remained at zero during the 3-year period. Three otters were trapped in 1997, none in 1998, and 2 in 1999. The wolverine harvest declined from an annual mean of 6.5 during the previous report period, to less than 2 during 1997–1999. The marten harvest decreased from the previous reporting period; 86 martens were sealed in 1997, 48 in 1998, and 61 in 1999.

Harvest Chronology. The chronology of the marten harvest for the 3 years during the report period is shown in Table 3. December and January continue to be the dominant months for harvesting marten. The wolverine and otter harvest was also concentrated into these months.

Transport Method. Trapper access relies much less on boats than in other parts of the region. Access by vehicle along the highway and logging road system is most common, and is used to support other types of access, such as snowmobiles and showshoes.

Habitat Assessment. Some marten habitat will be lost as old-growth forests, particularly riparian areas, are converted to clear-cuts. Many of the areas currently scheduled for harvesting, such as those along the upper Chilkat and Klehini Rivers, fall into this category. At present, all operable timberlands within the state forest are scheduled for cutting during the next 120 years, with several hundred acres being leased each year. Most of this land supports martens. Although impacts to wildlife populations are considered in timber harvest plans, mitigation measures or habitat enhancement opportunities for marten are limited due to their need for climax forests.

CONCLUSIONS AND RECOMMENDATIONS

Marten harvests during this reporting period dropped somewhat after an apparent rebound during the previous 2 years. It is not clear how much this movement is due to a change in trapper effort. Males continue to dominate the harvest, although the proportion of females has increased. At this time, there is no indication that any season or bag limit changes are needed. Monitoring sex ratios in the marten harvest should be continued and trapper interviews and questionnaires

should be used to gather qualitative information about marten abundance. Harvests of other species are low, but management objectives are apparently being met.

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Please cite any information taken from this section, and reference as:

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Table 1 Unit 1D furbearer harvest, 1989–1999

Regulatory year	Lynx	Martens	Otters	Wolverines
1989/1990	0	114	1	2
1990/1991	0	104	1	3
1991/1992	11	51	6	1
1992/1993	27	2	2	8
1993/1994	8	17	3	10
1994/1995	0	0	2	4
1995/1996	0	99	2	7
1996/1997	4	108	2	9
1997/1998	0	86	3	3
1998/1999	0	48	0	0
1999/2000	0	61	1	2

Table 2 Unit 1D marten harvest chronology by sex, 1994–1999

	1994/1995				1995/1996				1996/1997			
Month	Males	%	Females	%	Males	%	Females	%	Males	%	Females	%
November	0	0	0	0	10	83	2	17	0	0	0	0
December	0	0	0	0	36	92	3	8	12	60	8	40
January	0	0	0	0	24	73	9	27	68	77	20	23
February	0	0	0	0	3	20	12	80	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	---	0	---	73	74	2	26	80	74	28	26

	1997/1998				1998/1999[1]				1999/2000			
Month	Males	%	Females	%	Males	%	Females	%	Males	%	Females	%
November	0	0	0	0	0	0	0	0	0	0	0	0
December	13	72	5	28	10	83	2	17	27	61	17	39
January	32	67	16	33	4	67	2	33	7	78	2	22
February	10	67	5	33	17	81	4	19	7	88	1	12
Unknown	0	0	0	0	1	0	0	0	0	0	0	0
Total	55	68	26	33	32	80	8	20	41	67	20	33

[1] Does not include 8 martens of unknown sex, trapped in December.

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 2 (3,900 mi^2)

GEOGRAPHIC DESCRIPTION: Prince of Wales and all adjacent islands bounded by a line drawn from Dixon Entrance in the center of Clarence Strait, Kashevarof Passage, and Sumner Strait to and including Warren Island

BACKGROUND

Unit 2 includes Prince of Wales Island (POW) and a complex of smaller islands with their associated bays and estuaries. The combined archipelago consists of a large amount of sheltered waters that provide relatively safe boat access along many miles of shoreline. POW and many other islands have thousands of miles of logging roads accessible by motor vehicle. Thus, access to a large amount of furbearer habitat is exceptional and trappers can operate long traplines with relative ease. Clearcut logging has fragmented the landscape and in many cases, especially for marten, has reduced suitable habitat to narrow wildlife travel corridors. Concentrating furbearers and trappers, these travel corridors attract trappers and increase success.

Furbearer populations have remained at moderate-to-high levels during the past decade. Trapping pressure and harvests fluctuate annually, primarily as a function of changes in weather and fur prices. Recently the timber industry has scaled down and the result has been a high unemployment rate. This reduction in employment has provided residents with more time to trap and incentives for pursuing additional income from the sale of furbearer hides.

Southeast Alaska provides excellent habitat for land otters, and fur buyers consider Southeast pelts to be high quality. Pelt prices were high during the late 1970s, declined during the 1980s and early 1990s, and increased during the past few seasons. Because otters are difficult to trap and pelt preparation is time consuming, prices must be high to substantially influence harvest levels. Because most otter trappers use boats for transportation, weather often affects the intensity of effort.

Beaver prices have remained stable and low for several years. Beaver harvests can fluctuate dramatically from year to year because of the efforts of a few trappers.

Southeast Alaska trappers are more interested in martens than any other furbearer species. Martens are easy to trap, their pelts are easy to care for, and combined income from the pelts is

generally greater than for any other furbearer species in southern Southeast. With the exception of the 1986–1987 season when pelt prices jumped markedly, marten prices have remained consistent at moderate levels throughout the past decade. Extensive logging continues to remove uneven-aged old-growth habitat required by martens and as a result we believe the area's capacity to support marten populations will decline over time (Flynn and Schumacher 1997).

For at least the past decade mink pelt prices have remained low and stable. This has resulted in moderate-to-low interest among trappers.

Weasel populations fluctuate from year to year, independent of trapping. Harvest tends to be limited to incidental take while targeting other furbearers, primarily martens. Muskrats are absent from Unit 2.

Furbearers by order of importance to Unit 2 trappers include martens (*Martes americana*), land otters (*Lutra canadensis*), beavers (*Tamiasciurus hudsonicus*), mink (*Mustela vison*), and flying squirrels (*Glaucomys sabrinus*). Wolverines, foxes, coyotes, lynx and red squirrels are absent in Unit 2.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Seal harvested beaver, marten, otter, lynx, and wolverine pelts.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Our harvest data comes from mandatory sealing of marten, beaver, and otter pelts. We have discontinued the collection of mink harvest data, therefore the status of mink populations is assessed through staff observations and information obtained through annual trapper surveys.

Beaver pelts have been sealed for over 20 years. Wolverines were first sealed in 1971 and land otters have been sealed since 1978. Marten sealing was initiated in 1984.

We do not perform furbearer population surveys in Southeast Alaska. Some ecological information is available for mink and land otters from short-term research studies completed in Southeast (Harbo 1958, Home 1977, Larsen 1983, Woolington 1984, Johnson 1985). A study of marten ecology was recently completed on northeast Chichagof Island (Flynn and Schumacher 1997).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Unit 2 beaver populations have generally remained at moderate levels (Table 1). Habitat changes can cause large fluctuations in beaver populations (1990). Although early successional second-growth habitat can support higher populations of beavers than old growth, when second-growth canopy closes (approximately 20 years post-cutting), beaver numbers drop below those supported in old-growth stands. Current pelt prices are not high enough to foster much trapping pressure except in easily accessed areas such as along the road system.

Unit 2 trappers believe martens have remained at moderate-to high levels during this report period (Table 1). Marten populations tend to fluctuate annually throughout Southeast Alaska, likely related to changes in prey abundance. The extreme declines in other Southeast locations seem to be more dramatic, suggesting there may be alternative food sources to buffer martens when vole numbers decline. One untested hypothesis is that martens may benefit from deer carcass remains left by wolves. This reliable food source is not available in areas such as Unit 4 where wolves are absent. Discussions with trappers suggest that martens prefer old-growth stands and avoid clearcuts. This is consistent with findings of Flynn and Schumacher (1997), who found that martens avoid clearcuts and spend the majority of their time feeding and resting in older forest stands. We anticipate that reductions in old-growth habitat, increasing roads and traffic along fragmented habitat, and refugia loss will eventually result in fewer martens in the unit.

Trappers believe mink populations have fluctuated between moderate and high levels (range I_A= 42–100) in Unit 2 during this report period (Table 1). Given the current limited interest in mink pelts, we do not expect this to change unless pelt prices increase substantially.

Otter populations were believed to be low in the late 1970s when prices were high (Wood 1990). We believe that populations have steadily increased during the past decade and are presently at moderate-to-high levels. This is supported by information obtained from trappers. Since 1991 trappers have reported a perceived abundance of moderate-to-high levels ($\bar{x}$ =65). The 1992 index of abundance was the exception when the index dropped to the low (I_A =45). During this report period trappers reported otter abundance was high (Table 1).

MORTALITY

HARVEST

Seasons and Bag Limits.

Hunting		
Wolverine	Nov 10–Feb 15	One wolverine
Trapping		
Beaver	Dec 1–May 15	No limit

Lynx, mink, marten,		
Otter, weasel, muskrat	Dec 1–Feb 15	No limit
Wolverine	Nov. 10–April 30	No limit

Board of Game Actions and Emergency Orders. No Board of Game actions occurred and no emergency orders were issued during this report period.

Trapper Harvest. Unit 2 marten harvests are typically high compared to elsewhere in Southeast and during average years are second only to Unit 4, the highest Region I marten producer. However, during both 1996 and 1997, Unit 2 produced more marten than any other area in Southeast. During 1994–1997 unit 2 marten harvest reached the highest level ever recorded ($\bar{x}$ =1073), then, in 1998, declined by about 43%. The 1999 harvest showed an increasing trend (778).

The harvest of 285 otters during 1998 was the highest on record and well above the 10-year average of 145. Trappers unable to access many roads because of deep and persistent snow may have spent their time pursuing otters instead of martens in 1998. During this 3-year report period (1997–1999), an average of 221 otters were sealed, up from the long-term average of 141. Trapping rather than shooting remained the predominant method of take and most successful otter trappers relied on boats for transportation (Table 2). During this report period an average of 14% of the otters sealed were shot rather than trapped, slightly above the long-term average of 9%. Old-growth forest is preferred otter habitat and little use is made of cutover areas. Otters are most commonly found close to saltwater and prefer adjacent old growth habitat for resting and denning. Clearcut logging, both past and present, will substantially impact future otter populations as timber selections often occur in these preferred habitats.

The Southeast-wide harvest of 448 beaver during 1999 was the highest in recent years and well above the 5-year average of 329. The 1999 Unit 2 beaver harvest contributed considerably to this record. The Unit 2 harvest has fluctuated during the past 15 years from 411 in 1986 to a low of 64 in 1992. The average during the past 3-year report period was 219 with a high of 309 beaver in 1999. The low of 100 beaver sealed during the 1998 season may be a result of poor weather and less trapping effort rather than a declining beaver population.

Harvest Chronology. During the past 15 years about 30% of the beaver harvest occurred during December, followed by March (21%) and February (19%). Twenty-two trappers caught 138 beaver during March 2000, which is the most for any month during the past 10 years.

December is also the preferred month for marten trappers. Over the past 15 years about 70% of all martens taken are caught in December followed by January (25%) and February (5%). The 1998 season was slightly different with 85% of the harvest in December. Heavy snowfall in late December prevented trappers from accessing many roads during winter 1998. The average number of active marten trappers declined slightly during this 3-year report period ($\bar{x}$ =32), compared to the past 15 years ($\bar{x}$ =38).

During the past 15 years the land otter harvest has typically been split between December (41%), January (44%) and February (15%). The number of successful otter trappers during this 3-year report period ($\bar{x}$ =26) was similar to the long-term average ($\bar{x}$ =23).

Transport Methods. Trappers continue to use road vehicles (78%) and boats (19%) as the major modes of transportation to areas in Unit 2 (Table 2). The road system consists of over 2,000 miles of drivable surface and provides trappers and hunters with more road access than in any other unit in the region. During recent mild winters the road system has remained open and allowed trappers to reach most of the unit. The high 1999 beaver harvest (309) is likely a reflection of mild weather that allowed good road system access. The lack of snow on ponds and creeks created less work for beaver trappers and made trapping more efficient.

OTHER MORTALITY

Beavers were removed from specific areas because of flooding and erosion problems created by their cutting and damming activities. We issued 4 beaver depredation permits to communities and corporations during this report period.

CONCLUSIONS AND RECOMMENDATIONS

Unit 2 furbearer populations appear stable at this time. We anticipate increased trapper effort due to a reduction of logging.

Unit 2 marten ecology may differ from other Southeast populations due to a broader prey base. The increased beaver harvest contributed to a region-wide high harvest. The record 1998 otter harvest may have been enhanced by late snowfall, focusing trapping effort along the saltwater beach fringe.

Logging permanently removes uneven aged old-growth habitat, replacing it with even-aged, closed canopy habitat that does not meet the requirements of several furbearer species. It is therefore important to publicize effects from land use decisions so that tradeoffs for wildlife can be recognized and understood. The Roadless Initiative passed by Congress in 2000 will protect some prime furbearer habitat from future logging activities (USDA 2000). A current project to pave large sections of POW roads and a long-term plan to add additional state ferries will provide more access for trapping, hunting and other outdoor activities, all of which will place more demand on Unit 2 furbearers.

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Table 1 Unit 2 indices of abundance (I_A)[a] for furbearers[b], 1991–1999

	SPECIES			
REGULATORY YEAR	***BEAVER***	***MARTEN***	***MINK***	***OTTER***
1991/1992	62	44	67	67
1992/1993	50	39	45	45
1993/1994	12	12	42	50
1994/1995	50	25	75	67
1995/1996	33	83	100	83
1996/1997	37	50	75	50
1997/1998	42	82	80	72
1998/1999	48	62	90	85
1999/2000	72	68	85	68
$\bar{x}$	45	52	73	65

[a] Species are considered abundant when $I_A \geq 50$; moderate when $20 < I_A < 50$; and scarce when $I_A \leq 20$. From Brand and Keith (1979).

[b] Values derived from responses to trapper questionnaires

Table 2 Unit 2 furbearer reported harvests, 1984–1999

Species/regulatory year	Total take	Percent male	Method of take (percent)			Transportation used (percent)				
			Shot	Trapped or snared	Unk	Boat	Road	Air	Unknown	Other
Beaver										
1984/1985	234	--	0	100[a]	0	--	--	--	100	--
1985/1986	364	--	0	99	0	37	63	0	0	0
1986/1987	411	--	0	100	0	33	67	0	0	0
1987/1988	352	--	0	99	0	14	82	0	4	0
1988/1989	103	--	0	100	0	5	90	1	4	0
1989/1990	397	--	0	100[b]	0	12	88	0	0	0
1990/1991	172	--	0	100	0	9	85	0	3	3
1991/1992	257	--	0	99	1	25	75	0	0	0
1992/1993	64	--	0	98	2	45	38	0	0	17
1993/1994	204	--	0	100	0	13	87	0	0	0
1994/1995	161	--	0	100	0	11	87	0	0	2
1995/1996	281	--	0	100	0	9	89	0	0	2
1996/1997	291	--	0	100	0	19	76	0	0	5
1997/1998	249	--	0	100	0	17	81	0	0	2
1998/1999	104	--	0	100	0	26	70	0	0	4
1999/2000	310	--	0	100	0	5	88	7	0	0
Marten										
1984/1985	1039	57	0	100	0	--	--	--	100	--
1985/1986	571	56	0	100	0	--	--	--	100	0
1986/1987	301	58	0	100	0	63	37	0	0	0
1987/1988	1149	60	0	100	0	51	49	0	0	0
1988/1989	908	54	0	100	0	44	56	0	0	0
1989/1990	907	58	0	100	0	34	54	0	12	0
1990/1991	501	44	0	100	0	21	63	0	5	11
1991/1992	700	53	0	100	0	54	44	2	0	0
1992/1993	575	50	0	100	0	45	52	0	0	3
1993/1994	656	58	0	100	0	24	76	0	0	0
1994/1995	1038	64	0	100	0	38	48	0	0	14
1995/1996	1126	58	0	100	0	59	34	0	1	6
1996/1997	1052	56	0	100	0	26	69	0	0	5
1997/1998	1076	58	0	100	0	54	45	0	0	1
1998/1999	614	66	0	100	0	55	43	0	2	0
1999/2000	778	58	0	99	1	33	67	0	0	0

Table 2 Continued

Species/regulatory year	Total take	Percent male	Method of take (percent)			Transportation used (percent)				
			Shot	Trapped or snared	Unk	Boat	Road	Air	Unknown	Other
Otter										
1984/1985	192	50	8	85	7	--	--	--	100	--
1985/1986	141	59	2	97	1	62	10	0	28	0
1986/1987	62	70	3	82	15	74	26	0	0	0
1987/1988	176	56	8	90	2	76	22	0	2	0
1988/1989	92	61	2	98	0	91	9	0	0	0
1989/1990	154	56	10	90	0	85	15	0	0	0
1990/1991	40	53	20	78	2	68	22	0	0	10
1991/1992	43	51	16	81	3	70	23	2	3	2
1992/1993	66	56	23	74	0	70	23	0	0	7
1993/1994	108	59	6	94	0	50	50	0	0	0
1994/1995	232	62	4	96	0	74	25	0	0	1
1995/1996	198	63	5	95	0	76	20	0	0	4
1996/1997	94	47	1	99	0	52	37	0	0	11
1997/1998	186	52	17	83	0	82	18	0	0	0
1998/1999	288	59	10	82	8	79	13	0	8	0
1999/2000	193[c]	36	15	85	0	78	22	0	0	0

[a] One beaver was hit and killed by a car.

[b] One beaver was shot.

[c] One otter was an illegal kill.

Table 3 Unit 2 furbearer harvest chronology by month, 1984–1999

Species/regulatory year	Harvest periods							Successful trappers/hunters
	Dec	Jan	Feb	Mar	Apr	May	Unk	
Beaver								
1984/1985	52	54	38	40	32	18	0	--
1985/1986	66	96	66	95	34	7	0	--
1986/1987	120	66	96	74	26	29	0	21
1987/1988	90	87	34	73	45	13	10	29
1988/1989	31	4	7	2	48	11	0	16
1989/1990	199	79	6	76	26	9	2	22
1990/1991	18	56	59	17	17	5	0	17
1991/1992	120	46	17	46	12	11	5	17
1992/1993	36	4	10	2	11	1	0	10
1993/1994	109	27	10	26	25	7	0	20
1994/1995	58	35	29	15	24	0	0	19
1995/1996	55	31	37	67	25	6	60	18
1996/1997	114	58	43	57	13	0	6	22
1997/1998	48	39	59	76	12	0	15	21
1998/1999	31	12	16	7	10	10	18	13
1999/2000	53	39	60	138	18	2	0	22
Marten								
1984/1985	675	275	89	0	0	0	0	--
1985/1986	300	175	27	0	0	0	69	--
1986/1987	217	57	27	0	0	0	0	29
1987/1988	643	338	44	0	0	0	124	63
1988/1989	519	63	29	0	0	0	297	49
1989/1990	613	258	33	0	0	0	3	53
1990/1991	257	157	58	0	0	0	29	30
1991/1992	475	127	66	0	0	0	32	33
1992/1993	431	116	28	0	0	0	0	30
1993/1994	510	104	42	0	0	0	0	37
1994/1995	635	308	49	0	0	0	46	36
1995/1996	692	163	26	0	0	0	245	35
1996/1997	846	189	17	0	0	0	0	35
1997/1998	687	349	32	8	0	0	0	39
1998/1999	516	90	0	0	0	0	8	28
1999/2000	519	204	55	0	0	0	0	30
Otter								
1984/1985	55	93	44	0	0	0	0	--
1985/1986	43	82	16	0	0	0	0	--
1986/1987	35	23	4	0	0	0	0	19
1987/1988	36	103	34	1	0	0	2	27
1988/1989	60	21	11	0	0	0	0	17
1989/1990	60	66	28	0	0	0	0	29
1990/1991	6	19	12	0	0	0	3	14
1991/1992	16	19	7	0	0	0	1	19
1992/1993	18	26	21	1	0	0	0	20
1993/1994	31	52	25	0	0	0	0	25
1994/1995	106	90	36	0	0	0	0	26
1995/1996	61	72	21	0	0	0	44	23

Table 3 Continued

Species/regulatory year	Harvest periods							Successful trappers/hunters
	Dec	Jan	Feb	Mar	Apr	May	Unk	
1996/1997	53	38	3	0	0	0	0	18
1997/1998	78	76	27	0	0	0	5	23
1998/1999	145	116	27	0	0	0	0	30
1999/2000	95	79	16	1	0	0	1	25

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 3 (3,000 mi^2)

GEOGRAPHIC DESCRIPTION: Islands of Petersburg, Wrangell, and Kake areas

BACKGROUND

In previous years the Unit 1B and Unit 3 furbearer reports were combined in a single report. This year, for the first time, we have provided separate reports for each unit.

Furs, particularly those of the sea otter, attracted Russians to colonize Southeastern Alaska in the late 1700s and early 1800s. Ships from many nations came to the area to trade with natives for fur. In the early part of the twentieth century, fur farming was one of the biggest industries in Southeast. Blue and silver fox and mink were the primary species raised, but attempts were also made to raise raccoons, skunks, beavers, muskrats, and red fox (Burris, McKnight 1973).

At one time there were 200 fur farms in operation, according to U.S. Forest Service (FS) archaeologist Larry Roberts. From the 1930s to the 1950s, 5 to 9 fur farms operated on Kupreanof Island. Petersburg was the regional center for the blue fox industry, supporting 60 fur farms located on a nearby island in the mid 1930s (Roppel 1983). The University of Alaska experimental fur farm on Mitkof Island, where researchers studied captive mink, fox, and marten populations, operated from 1936–1972. Several small islands contained introduced populations of free roaming fox, a system unique to Alaska.

Past declines in some wild furbearer populations prompted regulations. In 1913 beaver trapping was prohibited for 5 years with a renewal of the prohibition extending the closure another 5 years. Martens were protected for 5 years starting in 1915.

Today most furbearer trapping is used as a winter income supplement and as a form of recreation. Seasons and bag limits have remained unchanged in recent years.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Seal harvested beaver, marten, otter, lynx, and wolverine pelts as they are presented for sealing.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Harvest information for beavers, lynx, martens, otters, and wolverines is collected from mandatory sealing. Location, harvest date, trapping and transportation method, and sex of all species are recorded on sealing certificates (except for the sex of beavers). We measure pelt size on beavers and otters, which provides an indication of harvested animals' ages. Additional harvest information on furbearer species is reported on fur export and fur acquisition reports.

Methods for estimating furbearer population abundance, trends, and distribution include mail-out questionnaires which local trappers received during the report period; interviews with trappers and fur buyers; and field observations by ADF&G and FS personnel.

The video "Alaska Guide to Fur Handling" was distributed to local trappers to help them maximize the dollar value of their furs through proper skinning and pelt preparation techniques.

We monitored logging operations, road construction, and other developments to assess potential habitat loss.

RESULTS AND DISCUSSION

POPULATION STATUS AND TRENDS

No formal field surveys were conducted in this unit to determine furbearer population status or trends. Information obtained from the trapper questionnaire and biologists' field observations provides our best indication of status and trends (Table 1).

Trappers reported that beavers appear abundant and stable throughout available habitat in Unit 3.

Lynx are not known to occur in Unit 3 and no harvest has been reported.

Trappers reported martens were common, but felt that populations decreased in 1996–1997. In 1997–1998 they reported martens were abundant with numbers declining. In 1998–1999 trappers reported martens abundant and stable.

Mink populations were reported to be abundant and stable during this report period.

Land otter populations were reported to be abundant and stable in 1996–1997, common and declining in 1997/98, and common and stable in 1998–1999.

Wolverines are considered scarce in Unit 3 although occasionally a few animals are harvested on Mitkof Island adjacent to the Unit 1B mainland. Three wolverines were harvested on Mitkof Island in 1997/98 but no harvest was reported in 1998–1999 or 1999–2000.

Trappers reported on the questionnaire that rodent populations were abundant and stable. The FS has conducted small mammal surveys on Mitkof Island since 1993 (Table 2). They have established transects in clearcuts, old-growth habitats, and mixed conifer stands. All 3 habitats have shown similar densities of *Peromyscus* with a low in 1993, a high in 1994, and a declining population in 1996 and 1997. No surveys were conducted during 1998 and 1999.

In 1997, the FS initiated a study of marten ecology on Mitkof Island. A total of 27 martens were successfully fitted with radiocollars, including 12 in 1997 and 15 in 1998. Of the 12 martens collared in 1997, 5 (42%) were trapped that year, 2 died of natural causes, and 4 had unknown fates. Of the 15 animals collared in 1998, 4 (27%) were trapped that year, 4 (27%) were trapped in 2000, and 6 had unknown fates. Of the 14 animals harvested by trappers, 8 (57%) were trapped $\leq$ 1 mile from their original capture location, 3 (21%) were trapped 1–2 miles from their original capture location, and 2 (14%) were trapped from 2–12 miles from their original capture location. The capture location of the one remaining marten was not reported.

MORTALITY

Season and Bag Limit.

Hunting

Wolverine	Nov 10–Apr 30	One wolverine

Trapping

Beaver (except Mitkof Island)	Dec 1–May 15	No Limit
Beaver (Mitkof Island)	Dec 1–Apr 15	No limit
Lynx, marten, mink, otter	Dec 1–Feb 15	No limit
Wolverine	Nov 10–Apr 30	No limit

Board of Game Actions and Emergency Orders. No Board of Game actions occurred and no emergency orders were issued during this report period.

Trapper Harvest. The number of beaver trappers in Unit 3 increased by 50% during this report period. Ten to 11 successful trappers harvested 56, 54, and 43 beavers in 1997, 1998, and 1999, respectively (Table 3). The marten harvest was above the 9-year mean of 188 in 1997 and 1998

when 274 and 221, respectively, were taken. The harvest decreased substantially in 1999 when 160 martens were taken. The decreasing trend in marten taken may have been related to the decrease in the number of successful trappers from 19 in 1997, to 16 in 1998, to 15 in 1999 (Table 4). Unit 3 had an otter harvest of 46, 33, and 41 during the 1997, 1998, and 1999 seasons, respectively (Table 5). The wolverine harvest remained low during this report period, with 3 taken in 1997, and none reported in 1998 or 1999 (Table 6). The wolverine harvest during this report period was consistent with the 9-year mean of 1 wolverine per year in Unit 3.

Harvest level is directly related to fur prices and winter weather conditions during the trapping season. Mink and beaver pelt values have been low in recent years. According to fur buyer Dean Wilson, Southeast martens vary widely in quality and color and bring lower prices than interior martens. However, the market favors Southeastern land otters because of their larger size, good color, and silky fur. The Oriental market has been particularly interested in land otters in recent years and prices have increased.

Harvest Chronology. Traditionally most of the Unit 3 furbearer harvest takes place in December and January, although a substantial portion of the beaver harvest can occur during February, March, and April. During this report period the majority of Unit 3 beavers were harvested during December and April (Tables 7–10).

Transport Methods. Most beaver and marten trapping areas in Unit 3 are accessed by highway vehicles and boats. Prior to 1997 the majority of Unit 3 marten trappers used boats to access their trapping areas. During this report period, however, the number of martens harvested by trappers using highway vehicles surpassed the number taken by those using boats (Tables 11 & 12).

CONCLUSIONS AND RECOMMENDATIONS

Most furbearer populations appear to be abundant or common and remain stable in suitable habitat. Trapping effort is moderate, reflecting the current low-to-moderate fur prices. Harvest is well below sustained yield potentials. Large areas of non-coastal habitat on the mainland and islands remain untrapped and provide refuge for furbearer populations.

I recommend no regulation changes at this time. All land development plans should be reviewed and commented on regarding effects to furbearer populations and trappers. ADF&G can maximize the value of the resource by working with local trappers through the Hunter and Trapper Education Programs.

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Table 1 Unit 3 results from trapper questionnaire, 1996–1999

	1996/97 Petersburg, Wrangell, Kupreanof and vicinity		1997/98 Petersburg, Wrangell, Kupreanof and vicinity		1998/99 Petersburg, Wrangell, Kupreanof and vicinity	
Furbearers species	Relative abundance	Trend	Relative abundance	Trend	Relative abundance	Trend
Beaver	abundant	same	abundant	fewer	abundant	same
Ermine	abundant	same	common	fewer	abundant	same
Lynx			x	x	scarce	same
Marten	common	fewer	abundant	fewer	abundant	same
Mink	abundant	same	abundant	fewer	abundant	same
Muskrat	scarce	same	scarce	same	scarce	same
Red Squirrel	abundant	same	abundant	fewer	abundant	more
Land Otter	abundant	same	common	fewer	common	same
Wolf	abundant	same	abundant	fewer	abundant	same
Wolverine	scarce	same	scarce	fewer	common	more
Prey species						
Grouse	common	same	common	fewer	common	same
Ptarmigan	common	same	scarce	fewer	scarce	same
Mice/rodents	abundant	same	abundant	fewer	abundant	same

Table 2 *Peromyscus*/100 trap nights, Unit 3, 1993–1997[a]

Year	Twin Creek clearcut	Twin Creek old growth	Twin Creek mixed conifer
1993	4	8.0	4.0
1994	20.7	20.0	21.0
1996	18	18.7	16.7
1997	15.3	15.3	4.8

[a] Conducted by FS on Mitkof Island.

Table 3 Unit 3 beaver harvest, 1991–1999

		Method of Take			
Regulatory year	Reported harvest	Trap/snare	Shot	Unknown	Successful trappers
1991/92	80	80	0	0	18
1992/93	34	33	1	0	8
1993/94	55	55	0	0	18
1994/95	25	24	1	0	5
1995/96	26	26	0	0	5
1996/97	44	44	0	0	6
1997/98	56	56	0	0	11
1998/99	54	53	0	1	11
1999/00	43	43	0	0	10

Table 4 Unit 3 marten harvest, 1991–1999

Regulatory year	Reported harvest						Successful trappers
	M	(%)	F	(%)	Unk.	Total	
1991/92	129	(60)	87	(40)	0	216	20
1992/93	41	(57)	31	(43)	0	72	8
1993/94	118	(67)	58	(33)	1	177	12
1994/95	53	(67)	17	(21)	9	79	7
1995/96	82	(35)	45	(19)	105	232	16
1996/97	98	(37)	55	(20)	109	262	23
1997/98	69	(25)	47	(17)	158	274	19
1998/99	59	(26)	35	(15)	127	221	16
1999/00	108	(68)	52	(32)	0	160	15

Table 5 Unit 3 land otter harvest, 1991–1999

Regulatory year	Reported harvest						Method of take					
	M	%	F	%	Unk.	Total	Trap/snare	%	Shot	%	Unk.	Successful trappers
1991/92	20	(29)	37	(54)	12	69	69	(100)	0	(0)	0	12
1992/93	7	(54)	6	(46)	0	13	11	(85)	2	(15)	0	5
1993/94	53	(65)	29	(35)	0	82	82	(100)	0	(0)	0	17
1994/95	29	(63)	13	(28)	4	46	43	(94)	3	(6)	0	8
1995/96	17	(52)	16	(48)	0	33	31	(93)	2	(7)	0	9
1996/97	32	(47)	22	(32)	13	67	62	(92)	5	(8)	0	14
1997/98	20	(43)	22	(48)	4	46	45	(98)	1	(2)	0	11
1998/99	18	(55)	9	(27)	6	33	33	(100)	0	(0)	0	11
1999/00	23	(56)	18	(44)	0	41	25	(61)	16	(39)	0	11

Table 6 Unit 3 wolverine harvest, 1991–1999

Regulatory year	Reported harvest						Method of take				Successful trappers
	M	%	F	%	Unk.	Total	Trap/snare	%	Shot	%	
1991/92	2	(100)	0	(0)	0	2	2	(100)	0	(0)	2
1992/93	1	(100)	0	(0)	0	1	0	(100)	0	(0)	1
1993/94	0	(0)	0	(0)	0	0	0	(0)	0	(0)	0
1994/95	1	(100)	0	(0)	0	1	1	(100)	0	(0)	1
1995/96	1	(100)	0	(0)	0	1	1	(100)	0	(0)	1
1996/97	1	(50)	1	(50)	0	2	2	(100)	0	(0)	2
1997/98	2	(67)	1	(33)	0	3	3	(100)	0	(0)	2
1998/99	0	0	0	0	0	0	0	(100)	0	(0)	0
1999/00	0	0	0	0	0	0	0	(100)	0	(0)	0

Table 7 Unit 3 beaver harvest chronology by month, 1991–1999

Regulatory year	Month								
	November	December	January	February	March	April	May	June[a]	*n*
1991/92	4	16	20	22	13	5	0	0	80
1992/93	7	19	2	0	0	6	0	0	34
1993/94	0	31	18	2	2	2	0	0	55
1994/95	12	1	1	1	9	0	1	0	25
1995/96	0	0	8	12	6	0	0	0	26
1996/97	0	12	5	18	9	0	0	0	44
1997/98	0	19	14	8	8	7	0	0	56
1998/99	0	21	4	0	0	24	1	4	54
1999/00	0	12	1	7	11	12	0	0	43

[a]Department of Transportation took 4 beavers that were damming culverts.

Table 8 Unit 3 marten harvest chronology by month, 1991–1999

Regulatory year	Month				
	December	January	February	Unknown	*n*
1991/92	139	56	21	0	216
1992/93	44	27	0	1	72
1993/94	68	73	36	0	177
1994/95	45	28	6	0	79
1995/96	89	67	76	0	232
1996/97	132	95	33	2	262
1997/98	189	64	17	4	274
1998/99	161	58	2	0	221
1999/00	94	56	10	0	160

Table 9 Unit 3 land otter harvest chronology by month, 1991–1999

Regulatory year	Month						*n*
	June[a]	July	Oct.	Dec.	Jan.	Feb.	
1991/92	0	0	0	37	16	16	69
1992/93	0	0	0	10	2	1	13
1993/94	0	0	0	28	45	9	82
1994/95	0	3	1	19	13	10	46
1995/96	0	0	0	20	7	6	33
1996/97	0	0	0	18	31	18	67
1997/98	0	0	0	25	11	10	46
1998/99	1	0	0	13	18	1	33
1999/00	0	0	0	15	12	14	41

[a] Accidental catch by Department of Transportation taking beavers that were damming culverts.

Table 10 Unit 3 wolverine harvest chronology by month, 1991–1999

Regulatory year	Month						
	November	December	January	February	March	April	*n*
1991/92	0	0	2	0	0	0	2
1992/93	0	1	0	0	0	0	1
1993/94	0	0	0	0	0	0	0
1994/95	0	0	0	0	0	1	1
1995/96	0	0	0	0	1	0	1
1996/97	0	0	1	1	0	0	2
1997/98	0	1	1	1	0	0	3
1998/99	0	0	0	0	0	0	0
1999/00	0	0	0	0	0	0	0

Table 11 Unit 3 beaver harvest, method of transportation, 1991–1999

Regulatory year	Airplane	Boat	3-wheeler	Highway	Skis/snowshoes	Snowmachine	Unknown	Total
1991/92	0	15	0	63	0	0	2	80
1992/93	0	5	0	29	0	0	0	34
1993/94	0	28	0	25	2	0	0	55
1994/95	8	10	0	7	0	0	0	25
1995/96	0	2	2	22	0	0	0	26
1996/97	0	12	0	26	5	1	0	44
1997/98	0	25	0	31	0	0	0	56
1998/99	0	38	0	16	0	0	0	54
1999/00	0	1	0	42	0	0	0	43

Table 12 Unit 3 marten harvest, method of transportation, 1991–1999

Regulatory year	Boat	3-wheeler	Snowmachine	Highway	Skis/snowshoes	Unknown	Total
1991/92	104	0	0	57	21	34	216
1992/93	39	0	12	21	0	0	72
1993/94	131	3	0	43	0	0	177
1994/95	57	22	0	0	0	0	79
1995/96	99	0	76	57	0	0	232
1996/97	170	8	29	55	0	0	262
1997/98	136	18	0	120	0	0	274
1998/99	72	9	5	120	15	0	221
1999/00	29	0	0	131	0	0	160

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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: 4 (5,800 mi^2)

GEOGRAPHIC DESCRIPTION: Admiralty, Baranof, Chichagof, and adjacent islands

BACKGROUND

Furbearer trapping in Game Management Unit 4 (Unit 4) was of greater importance in the past than it is today. Local Natives historically used furbearers for cultural and subsistence purposes and as items of trade. Russian settlement in the region was instigated by the quest for fur. More recently, trapping provides income during the winter when other cash generating opportunities are scarce, as well as providing recreational opportunities. However, recent government and other financial aid programs are at least partially responsible for diminishing the incentive to trap. Fur prices and the relative strength of the local economy, rather than furbearer abundance, has always been a major factor influencing trapping effort. Today most trapping has a strong recreational aspect although income remains important. Because most trapping is facilitated through boat transportation, weather often affects the amount of effort. Winter storms frequently preclude trapline access and, in extreme years, limits trapper activity. The use of motorized land vehicles is increasing in areas where logging roads remain open to public use.

Furbearers occurring in Unit 4 include martens (*Martes americana*), land otters (*Lontra canadensis*), mink (*Mustela vison*), short-tailed weasels (*Mustela erminea*), red squirrels (*Tamiasciurus hudsonicus*), and beavers (*Castor canadensis*).

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Provide for the expansion of beaver populations in western portions of the Unit (Chichagof and Baranof islands).

3. Seal harvested beaver, marten, and land otter pelts as they are presented for sealing.

4. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

5. Continue to monitor mink, marten, and land otter populations through carcass necropsies and evaluation of those data.

METHODS

Trappers were required to submit land otter, beaver, and marten hides to authorized personnel for sealing. Each marten and otter pelt was examined and sex was determined. Otters were sexed by the presence or absence of the preputial orifice. Marten pelts were sexed by the larger size of males (Strickland and Douglas 1987). After sorting, the presence of a preputial orifice and the direction of the growth of the underfur at the posterior end of the abdominal gland were used to verify sex (Lensink 1953 in ibid). Width and length measurements were recorded for otters and beavers. Trappers provided data on the method of take (trap, snare, or firearm), primary transport means, month of catch, and location of take.

A mail-out questionnaire was sent to Unit 4 trappers. Names and addresses were compiled from sealing documents. For the 1997/98 season, 69 trappers received questionnaires and responses were obtained from 19 (28% response rate). For the 1998/99 season, 51 trappers received questionnaires and responses were obtained from 19 (37% response rate). During 2000, 40 and 17 questionnaires were sent and received, respectively (43% response rate).

Responses to trapper questionnaires provided a profile of trappers and their activities and observations. Additionally, responses can provide an indication of the harvest of unsealed furbearers. Formerly the annual estimate of the Unit 4 mink take was based on the Sitka Area Biologist's estimates or by combining Fur Export Reports and Fur Acquisition Reports. Neither of these methods was accurate and severely underestimated the amount of harvest.

During this reporting period, I compared the number of martens reported harvested on the questionnaires versus the number sealed. Assuming the number sealed more accurately reflects the total harvest than questionnaire returns, I developed an annual conversion factor, which was then used to estimate the number of mink harvested. The conversion factor derived for marten was multiplied by the number of mink reported on questionnaire responses, resulting in a corrected mink capture.

Carcasses were collected from area trappers and necropsies were performed. A series of weights and standard body measurements were collected from martens, mink, and land otters. Sex and age classes were assigned to each carcass. Relative physical condition was assessed based on the amount of external and internal fat depositions (Whitman 2000). Stomachs were examined for presence and number of parasites, particularly the roundworm *Soboliphyme baturini*. Skulls, femurs, and, where appropriate, bacula, were collected and cleaned. Canine teeth were extracted and cementum analysis was conducted on animals presumed to be >1 year old. Other aging techniques were investigated and data were collected based on skull suture characteristics, baculum development, and femur morphology.

Sex and age ratios can be used to evaluate the relative extent of the harvest in some species and the current status of mink and marten populations. Data are presented in appropriate sections of this report. In addition, I used data from mink cementum aging to advance a plausible management scheme for that species. This manuscript was published elsewhere (Whitman in review, see Appendix A).

As indicated by Flynn (personal communication), small mammal abundance may reflect marten abundance. Therefore, I initiated small mammal snap-trap lines in an effort to monitor potential prey abundance and assess the technique's relative value as a predictor of marten abundance and harvests.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

In 1990 the U.S. Forest Service (USFS) and the Alaska Department of Fish and Game (ADF&G) began a cooperative study on marten ecology on northeast Chichagof Island (Flynn 1993). Marten densities in the study areas have been monitored since 1992 using mark-recapture techniques (Flynn and Schumacher, 1996). Marten numbers declined during winter 1992 and remained low into 1993. Marten numbers peaked in winter–fall 1996 and declined substantially by winter 1997. At the same time, the abundance of small mammals, especially long-tailed voles (*Microtus longicaudus),* showed a similar trend. Research has documented that marten prey primarily on long-tailed voles when available.

Although no formal population investigations resulting in statistically-sound density estimates are available for any Unit 4 furbearer species, evidence from trapper questionnaires appear adequate to reveal general population trends. During 1995–1999, trapper responses indicated that marten populations were moderate with a slightly increasing trend. Mink populations remained stable at moderate levels, while land otter populations apparently increased slightly to moderate levels (Fig. 1). Beaver and ermine populations were thought to be low, while red squirrels populations were moderate to high, increasing throughout the period. Trends in prey species can influence abundance of some furbearer species. Grouse and ptarmigan populations were generally thought to be quite low, with mice and vole populations high during 1995 and 1996, then dropping to moderate levels.

Another indication of relative population levels can be inferred from male to female ratios or from total young to adult female ratios in the harvest, particularly for martens. During the 1997/98 season, marten harvests consisted of 60% males, based on sealing documents. During the 1998/99 and 1999/00 seasons, the percent males in the harvest was 64 and 65%, respectively, indicating strong populations. Based on carcass collections from the 1998/99 and 1999/00 seasons, percentage of males in the harvest was 67 and 60%, respectively. Total young to adult female ratios are probably a better indication of population status (Strickland and Douglas 1987). Various Canadian jurisdictions use a ratio of 3:1 young to adult females for managing their seasons; if ratios fall lower, seasons are curtailed. Higher ratios signify populations where production and subsequent survival of young was high. Ratios from Unit 4 during 1998/99 were

4.8:1, and during 1999/00 were 13.4:1. These exceptionally high juvenile to adult female ratios appear to reflect secure marten populations.

Mink are throughout Unit 4, but are largely restricted to intertidal and riverine habitats. Populations are thought to be stable at relatively high densities (Whitman 2000, Whitman, *in review*, Appendix A). Based on trapline captures in good habitat near Sitka, densities of at least 12 mink per linear mile of beach exist. No statistically sound census techniques were employed.

Land otters are throughout the Unit 4 islands. No census data are available, but populations are thought to be stable.

Admiralty Island beaver populations are stable. Beaver numbers are low on Baranof Island. The season is currently closed on both Chichagof and Baranof islands.

Status of prey populations potentially available to martens and mink were investigated. From mail-out questionnaires, trappers indicated status and trends of red squirrels (*Tamiasciurus hudsonicus*), blue grouse (*Dendragapus obscurus*), ptarmigan (*Lagopus* spp.), and mice, voles, and shrews collectively. Squirrel populations were reported as moderate to high during 1995–99, with a generally increasing trend. Both grouse and ptarmigan numbers were low and stable. Small rodent and soricid populations were reported to be high during 1995 and 1996, declining to moderate numbers during 1997–1999.

Small mammal snaptrap lines were established during 1999, and 726 trap-nights resulted in 46 captures, indicating relatively high populations, especially of Sitka mice (*Peromyscus keeni*) and common shrews (*Sorex cinereus*). During 2000, only 310 trap-nights of effort yielded 10 captures, indicating small mammal populations had declined in comparison with the previous year (6.34 captures/100 trap-nights in 1999 vs. 3.23 captures/100 trap-nights in 2000), although captures of long-tailed voles (*Microtus longicaudus*) increased.

Population Composition

Marten

In 1997/98, sealing documents indicate that trappers caught 60% male martens, in 1998/99 sixty-four percent, and 65% in 1999/00 (Table 1). In the ADF&G research program, 59% males were caught in 1991/92 (Flynn and Blundell 1992), and in 1992/93 the ratio was 60% male (Flynn 1993). Because of possible sex-based differences in the vulnerability of marten to trapping, these ratios may not accurately reflect the sex ratio in the wild (Buskirk and Lindstedt 1989).

According to Flynn and Schumacher (1994), juvenile martens significantly increased in the population in 1993/94 from the low levels recorded the previous years. This increase coincided with a 2-fold increase of mice and voles on their study areas. They concluded that marten numbers were recovering on northern Chichagof Island, but recruitment to the south appeared to be lagging a year behind.

A total of 98 marten carcasses were collected and necropsied during the 1998/99 season. Sixty-six were males (67%). The total young to adult female ratio in the harvested sample was 4.8:1.

This ratio suggests reasonable production and survival of pups during spring 1998, with the overall marten population probably stable.

Of 179 marten carcasses necropsied during the 1999/00 season, 107 were males (60%), indicating only a slight difference from the overall catch rates gathered from sealing documents. Based on cementum analyses, 134 (75%) were young-of-the-year, with the remainder ranging from 1 to 7 years of age (Fig. 2). The total young to adult female ratio was 13.4:1. This extremely high young to adult female ratio is probably reflective of a healthy, expanding marten population. It should be noted, however, that the sample of carcasses was collected from northern Baranof and southern Chichagof islands where logging activities have been minor. Necropsy data from the 2000/01 season have yet to be analyzed.

Land Otter

The percentage of male land otters taken by trappers was 57% in 1997/98, 57% in 1998/99, and 59% in 1999/00 (Table 1). In an effort to obtain morphological measurements that would allow age class determination without the time and expense involved in cementum analyses, skulls, femurs, and bacula were collected from otters harvested near Sitka. After cleaning, 6 skull measurements were recorded from 41 otters whose age at death was determined by cementum analysis. Prior to cementum aging, individuals were assigned to a discreet age class (young-of-the-year, yearling, and adult) based on tooth wear patterns and degree of suture closure. Cementum age determination corresponded well with the more subjective age class designations.

Five of the 6 skull measurements (total length, zygomatic width, inter-orbital width, post-orbital process width, and mastoid width), baculum weight, and femur length generally increased with age, although regression analyses on any individual measurement failed to differentiate discreet age or even age class. Post-orbital constriction width, however, showed a negative relationship when regressed against cementum age. Contrary to findings of Friley (1949) and Lancia and Hair (1983), I found only a slight positive relationship between baculum weight and age.

Unlike most other mustelids, none of the skull measurements I investigated were diagnostic for determination of sex in land otters, although other investigators have noted weight dimorphism (Melquist and Hornocker 1983). I will continue to collect skulls, bacula, and femurs from harvested otters in an effort to determine statistically meaningful sexing and aging criteria.

Ages of harvested land otters from the 1998/99 season were investigated. Animals were judged to be young-of-the-year (<1 year-old) if nasal or zygomatic sutures were clearly evident in cleaned skulls, apices of canine roots were open, or if the distal femur symphysis was evident. Animals judged to be $\geq$1 year were aged based on canine cementum analysis (Matson's Laboratory, Montana).

Mean age of the 1998/99 harvested otter sample was 2.90 ($\pm$0.663, p=0.10) years (n=49), and ranged from 0 to 11 years (Fig. 3). There was no difference between mean ages of males (n=29 and females (n=20) ($p<0.05$).

Because of their larger home ranges and their propensity to travel more, male land otters are more vulnerable to trapping (Melquist and Dronkert 1987). Thus the percent of males in the

harvest is usually greater than females. As harvest pressures increase, the proportion of females often increases, and may signify harvest above sustainable limits. Unit 4 otter harvests ranged from 63 to 226 animals during 1977/78 through 1997/98, and percent males in the harvest ranged from 39.7 to 64.0 (mean 53.5%). There was no indication that increases in the harvest resulted in a decline in male percentages in the harvest, and I suspect that the relatively light harvest has little impact on the otter population.

Annual variations in mean age of harvested otters may be useful in determining population trend. While any single year provides limited data upon which population status assumptions can be made, it does provide baseline data for comparative purposes.

Mink

A manuscript was recently submitted to the Canadian Field-Naturalist for publication concerning mink population parameters and management recommendations in Unit 4 (see Appendix A).

MORTALITY

Harvest

Seasons and Bag Limits

Hunting		
Coyote	Sep 1–Apr 30	2 coyotes
Wolf	Aug 1–Apr 30	5 wolves
Wolverine	Nov 10–Feb 15	1 wolverine
Trapping		
Beaver (that portion east of Chatham Strait)	Dec 1–May 15	No limit
Beaver (that portion west of Chatham Strait)	No open season	
Coyote, red fox, lynx, otter	Dec 1–Feb 15	No limit
Marten and mink, Chichagof Island east of Idaho Inlet and north of Trail River and Tenakee Inlet and north of a line from the headwaters of Trail River to the head of Tenakee Inlet	Dec 1–Dec 31	No limit
Marten and mink, remainder of Unit 4	Dec. 1–Feb. 15	No limit

Board of Game Actions and Emergency Orders. No Board actions were taken and no emergency orders were issued during the period.

Trapper Harvest. Of 746 marten pelts sealed in 1997/98, 447 were males, 298 were females, and 1 was of unknown sex. In 1998/99, 559 were examined; 358 were males, 200 were females, and 1 was of unknown sex. In 1999/00 there were 730 males, 396 females, and 8 of undetermined sex, for a total of 1134. Table 1 summarizes the sexes of martens in the harvest for the 1995–2000 regulatory years.

Comparison of marten harvest data from sealing documents and from trapper questionnaires resulted in a conversion factor of 2.73 for 1998/99, and 2.12 for 1999/00 (number of sealed marten/number of marten reported on trapper questionnaires). Using those same conversion factors for mink, I estimate that 221 mink were taken from the unit during 1998/99 and 333 mink were harvested during 1999/00.

Two hundred twenty-eight land otters were sealed in 1997/98, 130 males and 98 females. In 1998/99 there were 81 males and 62 females, for a total of 143. The 1999/00 harvest was 116 otters, 69 males, 41 females, and 6 of undetermined sex. Harvest sex ratios since 1995 are presented in Table 1.

Hunter Residency and Success. During the 1997/98 season, 41 trappers reported catching martens, 35 of which were residents of the unit. In 1998/99 there were 27 marten trappers, 23 who listed residency in Unit 4. For 1999/00 there were 34 trappers, of which 26 were unit residents (Table 2).

Of the 20 trappers sealing otters, 15 claimed Unit 4 residency in 1997/98. In 1998/99 16 otter trappers reported catching otters, all claiming unit residency. For 1999/00 there were 21 trappers with 16 unit residents (Table 2).

Harvest Chronology. The greatest marten harvest occurred in the first month of the trapping season. A total of 584 (78%) of the 1997/98 marten were taken in December. In 1998, 462 (83%) martens were caught in December. In 1999 the December harvest was 1007 (89%) (Table 3).

In 1997/98, 90 (39%) of all trapped otters were taken in December. For the 1998/99 and 1999/00 seasons, 97 (68%) and 91 (78%), respectively, were taken in December (Table 3).

Transport Methods. Trappers using boats for transportation take most martens. In 1997/98, 81% of all martens were taken by trappers who used boats; in 1998/99, 86%; and in 1999/00, 91% (Table 4). Other transportation means that may be important in any given year include snowmachines, 4-wheelers, highway vehicles, and walking. Weather conditions influence the degree to which these other transportation types are used in any given year.

The otter take is almost entirely with the aide of boats. For the 1997/98, 1998/99, and 1999/00 seasons, respectively, boats were reportedly used for 97%, 93%, and 97% of the harvest.

HABITAT

Assessment

The carrying capacity for martens is undoubtedly decreasing in many Unit 4 areas because of clearcutting of old-growth habitats. Martens have been found to spend most their time in old-

growth forest (Flynn 1991). Clearcutting may also be impacting otters; Larsen (1983) reported otters made little use of shorelines associated with clearcuts. Intertidal areas and immediately adjacent upland habitat is probably secure in terms of mink habitat.

CONCLUSIONS AND RECOMMENDATIONS

Seasons for most furbearer species have remained the same for many years. Federal subsistence regulations supersede state regulations on federal lands under the terms of the Alaska National Interest Lands Claim Act (ANILCA). Federal lands on Chichagof Island were closed to mink, marten, and weasel trapping in 1994, and in 1995 and 1996 were open for a December-only season. Nonfederal lands remained open under state regulations during the 3-year period. The discrepancy between state and federal regulations confused the public and created management problems.

The decline of marten populations during this report period may have been affected by trapping, but probably correlates directly to the densities of small mammals. The high 1991/92 harvest was in part due to nutritionally stressed martens moving more and being more vulnerable to trappers. As pointed out by Strickland and Douglas (1987), it is impractical to set harvest levels by determining an absolute population level. The need for trapping restrictions can be supported by monitoring the sex ratio and the presence of juveniles in the harvest (Strickland and Douglas 1987, Young and Schenck 1991). Because the population is now relatively high, existing trapping regulations are appropriate. With further population increase more liberal season dates may be appropriate. As martens are often captured in mink sets, the seasons for the 2 species should coincide to reduce the incidental take of martens at the low end of their cycle.

Otter populations appear to be healthy and trapping pressure is light. I do not recommend any change in trapping regulations at this time.

The beaver harvest remained low during the report period. This is likely because of a small demand for beavers and the dearth of habitat in the unit. Timber harvest in Chichagof Island valley bottoms appears to favor beaver habitat, but the absence of beavers in such areas may be keeping it from being utilized. Continued closure of beaver trapping west of Chatham Strait is recommended to encourage natural expansion of beavers into areas of re-growth.

Given the cyclic nature of marten populations and economic factors that affect trapping effort, management objectives based on some past harvest levels are not realistic. Further, reasonable means of monitoring population densities over such a large area are not available to establish appropriate yearly harvest objectives. Therefore the evaluation of population status will continue to be subjective. Examining harvest statistics and anecdotal information from trappers and local residents can enhance this. With reduced fur prices and decreasing interest in trapping, the possibility for over trapping most species appears low. Specific harvest or population objectives cannot be used as management standards without programs in place that document population status. We intend to evaluate the practicality of a management objective regarding marten sex ratios in the harvest.

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Table 1 Unit 4 furbearer harvest data, 1995–1999

Season	Male	Female	Unknown	Total
Marten				
1995/96	520	245	2	767
1996/97	962	576	21	1559
1997/98	447	298	1	746
1998/99	358	200	1	559
1999/00	730	396	8	1134
Otter				
1995/96	87	91	9	187
1996/97	64	36	0	100
1997/98	130	98	0	228
1998/99	81	62	0	143
1999/00	69	41	6	116

Table 2 Unit 4 trapper residency and success, 1995–1999

Season	Local[a]	Nonlocal	Nonresident	Total
Marten				
1995/96	39	11	0	50
1996/97	43	12	0	55
1997/98	35	6	0	41
1998/99	23	4	0	27
1999/00	26	8	0	34
Otter				
1995/96	19	7	0	26
1996/97	17	5	0	22
1997/98	15	5	0	20
1998/99	16	0	0	16
1999/00	16	5	0	21

[a]Unit 4 residents.

Table 3 Unit 4 furbearer harvest chronology by month, 1995–1999

Season	November	December	January	February	Seasonwide	Total
Marten						
1995/96	0	607	155	5	0	767
1996/97[a]	9	1192	303	51	4	1559
1997/98	0	584	156	6	0	746
1998/99	0	462	78	19	0	559
1999/00	0	1007	117	10	0	1134
Otter						
1995/96	0	143	38	6	0	187
1996/97	0	27	61	12	0	100
1997/98	0	90	123	15	0	228
1998/99	0	97	45	1	0	143
1999/00	0	91	23	2	0	116

[a]November kills are illegal.

Table 4 Unit 4 successful trapper transport methods, 1995–1999

Season	Airplane	Horse/ dog team	Boat	Highway vehicle	4-wheeler/ snowmachine	Walked	Off-road vehicle	Unknown
Marten								
1995/96	3	0	503	67	82	98	14	0
1996/97	24	0	1068	312	59	96	0	0
1997/98	0	0	604	47	54	41	0	0
1998/99	0	0	483	38	14	24	0	0
1999/00	2	0	1034	0	1	81	16	0
Otter								
1995/96	0	0	175	0	0	11	0	1
1996/97	1	0	89	0	0	10	0	0
1997/98	0	0	222	3	0	3	0	0
1998/99	0	0	133	6	0	4	0	0
1999/00	0	0	112	0	0	4	0	0

APPENDIX A.

Age Structure Differences in American Mink, *Mustela vison*, Populations under Varying Harvest Regimes

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Whitman, J.S. 2000. Age structure differences in American Mink *(Mustela vison)* populations under varying harvest regimes. Canadian Field-Naturalist XXX(X):XXX-XXX.

Two American Mink populations were examined using canine tooth cementum annuli to assess age structure of harvested segments of the populations. Trapping mortality was different between these 2 populations. Comparisons are made with a Montana Mink population. I propose that furbearer managers can readily assess relative harvest pressures by analyzing the age structure of a Mink population, and offer management recommendations for populations displaying various age structures.

Key Words: American Mink, *Mustela vison*, age structure, cementum, harvest management, Alaska, Idaho, Montana.

Raw fur prices fluctuate dramatically due to unpredictable fashion trends, thus trapping effort varies accordingly, without predictable trends. The American Mink (*Mustela vison*) is one of several species that are harvested throughout most of the United States and Canada (Eagle and Whitman 1987), and are considered a valuable fur resource (Deems and Pursley 1983). As early as 1938 it was recognized that intensive trapping can cause local declines in Mink populations (Errington 1938, McCabe 1949). However, furbearer managers are often at a disadvantage when assessing the status of various populations because of inadequate funding or staffing.

In the absence of empirical population data, information presented herein may provide managers with a reasonable and relatively inexpensive tool for assessing the status of Mink populations. Mink carcasses can be collected from trappers and, in addition to assessing other parameters (diet, fat indices, sex ratios, reproductive status, etc.), canines or other teeth can be extracted, processed, and evaluated. A low incidence of juveniles in the harvested segment of the population may indicate low harvest pressure, or may signal the presence of more severe environmental problems, such as the presence of toxic contaminants (Aulerich et al. 1974, O'Shea, et al. 1981).

STUDY AREAS

Two divergent American Mink populations were analyzed. A population in west central Idaho (Upper Payette River drainage, Valley County) was studied between 1977 and 1980 (Whitman 1981). This population (Idaho) inhabited a high glacial valley, ranging from 1500-2000 m elevation in a riverine habitat. Weather conditions were continental, typified by accumulations

of winter snow (mid-November through mid-April) and temperate, dry summers. Yearly precipitation averaged 64 cm. Temperature variations ranged from an average of –7.4°C in January to 17.1°C in July. This study area encompassed at least 9 traplines that had been trapped annually for several decades at a moderate intensity.

A second Mink population in the Alexander Archipelago in Southeast Alaska (Alaska), on Baranof and Chichagof islands near Sitka, inhabits a marine coastal environment characterized by temperate, rainy conditions. Snow accumulations were highly variable, but rarely amount to more than 30 cm. Average annual precipitation was 219 cm, with temperature means of 3°C to 17°C in January and August, respectively. Carcass collections from this area were from the 1999/2000 trapping season, a year with no measurable snow accumulation at tideline. Area trappers catch Mink only incidentally while targeting American Marten (*Martes americana*) and River Otter (*Lontra canadensis*), and harvest pressures are extremely light.

METHODS

Mink carcasses from trapper harvests during open seasons (November-January) were collected in both study areas. Lower canine teeth were extracted from most animals suspected to be adults based on presence or absence of the suprasesamoid tubercle (Greer 1957), skull and bacular morphology, tooth wear, or skull suture characters. Canines were sectioned, stained, and analyzed for number of cementum annuli (Matson's Laboratory, Milltown, Montana). Cementum annuli were assumed to represent the actual age of Mink in years (Eagle and Whitman 1987).

Following cementum analysis, data were graphed using Microsoft Excel software, and logarithmic regression analysis was used to fit curves to the data. There were no significant differences between sexes in age class distribution, so sexes were lumped. Forty-two and 81 Mink were used for Idaho and Alaska samples, respectively.

In an attempt to clarify data reported by Mitchell (1958), and to compare those data with my own, I have assumed that his "adult" animals were all between the ages of 1 and 3 years. Because he did not report actual ages of adults, my use of his information to construct log curves is largely speculative.

RESULTS AND DISCUSSION

Of 42 Mink collected from fur trappers in the Idaho study, 17 were adults (older than 1 year), for a juvenile to adult ratio of 1.47:1. In the Alaska sample, 45 of 81 animals were adults (0.08:1 ratio) (Table 1). The oldest animal in both populations was a single 4-year old, confirming reports of Mitchell (1961) in Montana, Gerell (1971) in Sweden, and Askins and Chapman (1984) in Maryland that population turnover generally occurred during a 3-year period. Mitchell (1958) compared ages of Mink in intensively harvested areas versus unharvested areas, and reported dramatically different demographic parameters (juvenile:adult ratios of 4.5:1 and 0.3:1, respectively).

In the Idaho study, Mink harvest was believed to be moderate, had been occurring for more than a decade prior to the investigation, and continued throughout the 1977–1980 study. Mink were

relatively abundant but populations were assumed to be below carrying capacity. In the Alaska investigation, trappers incidentally caught Mink in sets primarily designed for American Marten (*Martes americana*), but their effects on Mink populations were thought to be negligible. Because Marten did not exist on islands over most of the area, Mink had not been trapped prior to this investigation for at least 5 years. Thus, harvest pressures were assumed to be extremely light, and Mink probably existed at or near carrying capacity.

Contrasting the age structure of the 2 subject populations (Figure 1), and further, comparing these data with that of Mitchell (1958)(Figure 2), it is probable that furbearer managers can use age structure data as one indicator of the effects of trapper harvest on Mink populations. If logarithmic curves can be closely fit to the resultant age structure data, the steepness of the curves can be used to estimate harvest intensity. Obviously, Mink populations exist at widely differing densities throughout their range, largely dependent on carrying capacity of various habitats. High or low catches per unit area or per unit effort do not necessarily reflect high or low harvest pressure.

Using juvenile to adult ratios to assess harvest pressures can also be used without the time and expense of cementum analyses (Table 1) using my assessment of relative harvest pressure. In areas where the juvenile to adult ratio is greater than 2.0:1 and trapping is intense, managers should consider modifying regulations to reduce the harvest. However, where Mink trapping is incidental to other species, alignment of seasons is often an overriding management consideration. Additionally, where Mink harvest is incidental, adults may be more aggressive in patrolling their respective home ranges and thus more vulnerable to capture.

Interestingly, most authors agree that a high proportion of young in the harvest of American Marten is desirable (Strickland and Douglas 1987). Thus, from the data contained herein, there appears to be an incongruity in prescribed management of 2 closely related species. This can perhaps be explained by species differences in home range use and the relative numbers of dispersing and transient young-of-the-year animals in the populations. The greater vulnerability of young Martens is probably due to a number of factors, including lack of established home ranges and lack of experience. Young Mink, on the other hand, probably disperse from their natal ranges earlier than Martens, establishing home ranges before the trapping season commences (Gerell 1970), or may remain as residents in their natal home ranges (Harbo 1958).

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Table 1. Juvenile:adult ratios from 4 harvest regimes in Montana, Alaska, and Idaho showing the continuum and with recommendations for furbearer managers.

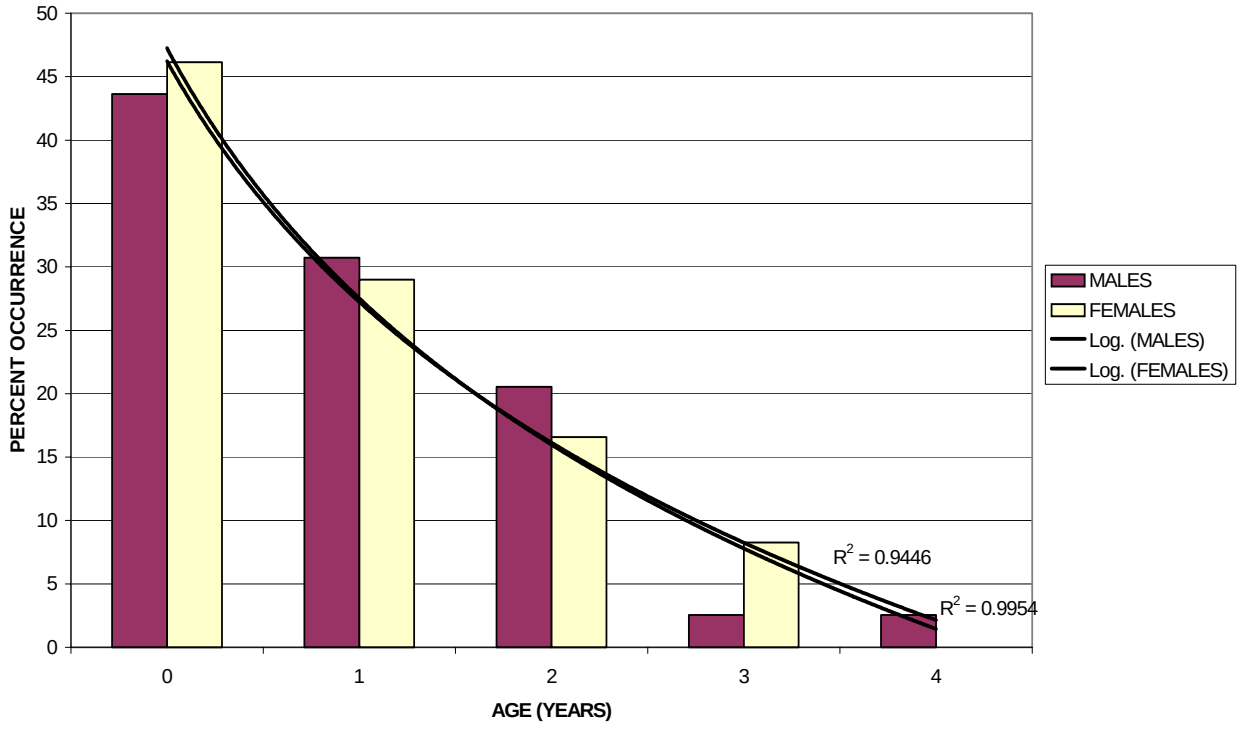
Figure 1. Comparison of age classes in the harvest of two American Mink (*Mustela vison*) harvest regimes from Alaska, where no recent prior harvest had occurred, and from Idaho, where harvest was ongoing but relatively moderate.

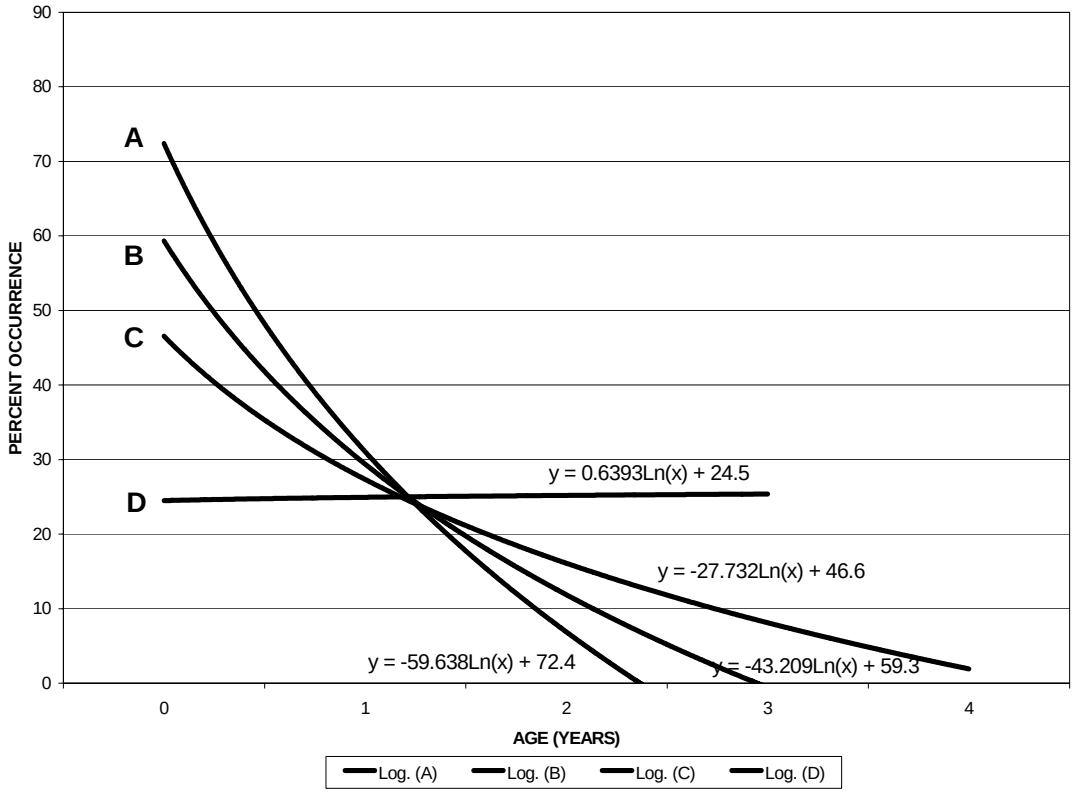
Figure 2. Theoretical (lines A and D) and actual (lines B and C) logarithmic regression lines of American Mink age distribution ranging from a population with very heavy trapping pressure (line A) through a population with light trapper exploitation (line D).

Table 1.

Relative Harvest	Author	Location	Juv:Ad Ratio	Recommended Management Action
No Harvest	Mitchell	Montana	0.3:1	Nothing; Perhaps encourage harvest
Very Light Harvest	This Study	Alaska	0.8:1	Nothing
Moderate harvest	This Study	Idaho	1.5:1	Monitor future harvests closely
Heavy Harvest	Mitchell	Montana	4.5:1	Reduce or eliminate open seasons

AGE DISTRIBUTION OF *Mustela vison* IN 1999-2000 HARVEST
GAME MANAGEMENT UNIT 4, SOUTHEAST ALASKA
(No prior harvest)




90
80
70
60
50
40
30
20
10
0
PERCENT OCCURRENCE
A
B
C
D
y = 0.6393Ln(x) + 24.5
y = -27.732Ln(x) + 46.6
y = -59.638Ln(x) + 72.4
y = -43.209Ln(x) + 59.3
0
1
2
3
4
AGE (YEARS)
Log. (A)
Log. (B)
Log. (C)
Log. (D)

Alaska Department of Fish and Game
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FURBEARER MANAGEMENT REPORT

From: 1 July 1997
To: 30 June 2000

LOCATION

GAME MANAGEMENT UNIT: Unit 5 (5,800 mi^2)

GEOGRAPHIC DESCRIPTION: Cape Fairweather to Icy Bay, eastern Gulf of Alaska coast.

BACKGROUND

Furbearer species probably gained access to the Yakutat Forelands via the Alsek/Tatshenshini corridor (Klein 1965). Beavers, land otters, and mink are the common water-associated species; muskrats are noticeably absent although they were once plentiful according to some Yakutat residents. Lynx are present in small numbers, while martens are found in fair abundance. Wolverines probably occur in low numbers over extensive areas. Trapping pressure has historically been light throughout the Malaspina and Yakutat Forelands.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

1. Provide information to the Board of Game to further maintenance of viewable and harvestable populations of furbearers.

2. Seal harvested beaver, marten, otter, lynx, and wolverine pelts as they are presented for sealing.

3. Contact reliable observers for general information about the status and trends of furbearer populations, including the use of an annual trapper survey.

METHODS

Staff from the Divisions of Fish and Wildlife Protection and Commercial Fisheries and Management in Yakutat and Wildlife Conservation Division staff in Douglas sealed furbearer hides. All known trappers were encouraged to fill out a trapper survey to provide us with information on furbearer abundance and trapping effort.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Trapping pressure is generally light within this subunit and trends in harvest reflect several factors in addition to furbearer population levels. One or two individuals changing their trapping intensity can have substantial affect on harvests, as in the marten harvest during this period. Indications are that most furbearer populations are stable in Unit 5. The lynx harvest declined from the spike in the last year of the previous report period, which was probably related to the immigration of lynx to the Yakutat area from Canada. Little is known of marten abundance, but all indications are that they are common in forested regions of the unit. Land otters are more common in Unit 5 than the harvest would indicate. Low trapping effort accounts for the scarcity of these animals in harvest records. As with other furbearers, no population estimate exists for wolverines. It is believed that they occur at low densities in areas remote from habitation or roads.

MORTALITY

Harvest

Seasons and Bag Limits

Hunting

Beaver, marten, otter, mink, red fox, lynx	No open season	
Coyote	Sep 1–Apr 30	Two
Wolverine	Nov 10–Feb 15	One

Trapping

Beaver	Nov 10–May 15	No limit
Coyote	Dec 1–Feb 15	No limit
Red Fox	Dec 1–Feb 15	No limit
Lynx	Dec 1–Feb 15	No limit
Marten,	Dec 1–Feb 15	No limit
Mink, weasel	Nov 10–Feb 15	No limit
Otter	Nov 10–Feb 15	No limit
Wolverine	Nov 10–Apr 30	No limit

Board of Game Actions and Emergency Orders. No Board actions were taken and no emergency orders were issued during the period.

Trapper Harvest: Table 1 shows the furbearer harvest since 1986. Only 4 trappers brought in furs for sealing during any given year of this reporting period. The beaver harvest was higher than during any of the previous 4 report periods. It is important to note that all the beavers captured in 1998 and 1999 were taken under 5 AAC 92.041 (permit to take beavers to control damage to property) on airport property. Few trappers are targeting beavers in other areas because of the low price and the amount of work it takes to catch and prepare beaver hides for sale.

There were no lynx harvested during this report period. Given the ease with which lynx can be trapped, the lack of harvest is a fair indication that lynx were scarce or absent.

The harvest of 229 martens in 1997 was the second highest in the past 15 years. The harvest declined to 134 in 1998 and no martens were harvested in 1999.

Otter harvest was at an all time high of 10 in 1997 then declined to 4 in 1998, and as with martens, there was no harvest in 1999. The absence of martens and otters harvested in 1999 was likely due to the lack of trapping effort by one individual who typically accounts for a large percentage of the Unit 5 furbearer harvest. The wolverine harvest went from a historical high of 24 during the previous report period to only 8 during 1997–1999. The dramatic decline in the wolverine catch was likely due to a lack of trapper effort more than the absence of wolverines.

Harvest Chronology: Most furbearers were caught in early to mid-winter. Based on the number of animals caught with the use of highway vehicles for transportation, the closure of the Yakutat road system (by snow accumulation) may have also affected the harvest timing. Otter and wolverine harvests peaked in December, although several animals were caught in November and January. A large proportion of the 1998 and 1999 beaver harvest was taken in August and September, prior to the trapping season. These animals were taken under a permit issued by ADF&G.

Table 2 shows the chronology of the marten harvest. December accounted for the bulk of the 1997 harvest, while in 1998 January was the most prolific month for marten trappers.

Transport Methods: Four wheelers and snowmachines were the most commonly used transport mode for marten trappers during this period, with highway vehicles and boats being less commonly used. For other species, highway vehicles were most commonly used, with the use of snowmachines, 4-wheelers, boats, and airplanes being much less common.

CONCLUSIONS AND RECOMMENDATIONS

We believe harvests were within sustainable limits during the report period. Therefore, furbearer harvests met management objectives. It is not possible to determine if the annual harvest indicates declining, stable, or increasing populations because of the variation in trapper effort from year to year. This variation is a reflection of both the amount of trapping effort directed at furbearers, as well as the intensity of the effort. Because of this it is important to continue to

collect information on furbearer populations from trapper interviews as well as annual trapper surveys. These can provide us with a subjective measure of the relative abundance of furbearers.

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Table 1 Unit 5 furbearer harvest, 1986–2000

Regulatory year	Beavers	Lynx	Martens	Otters	Wolverines
1986/1987	8	0	38	2	2
1987/1988	7	0	111	1	1
1988/1989	3	10	17	0	0
1989/1990	4	6	22	0	0
1990/1991	3	0	83	1	3
1991/1992	8	0	47	1	0
1992/1993	1	0	20	6	2
1993/1994	9	14	76	7	0
1994/1995	0	5	289	4	8
1995/1996	4	5	116	2	4
1996/1997	1	2	103	0	12
1997/1998	11	0	229	10	4
1998/1999	3	0	134	4	3
1999/2000	8	0	0	0	1

Table 2 Unit 5 marten harvest chronology by sex, 1994–2000

	1994/1995				1995/1996				1996/1997			
Month	Males	%	Females	%	Male	%	Females	%	Males	%	Females	%
November	20	44	25	56	6	60	4	40	0	0	0	0
December	47	56	37	44	57	54	48	46	28	60	19	40
January	12	50	12	50	0	0	0	0	33	59	23	41
February	28	70	12	30	0	0	0	0	0	0	0	0
Unknown	64	67	32	33	0	0	1	100	0	0	0	0
Total	171	59	118	41	63	54	53	46	61	59	42	41

	1997/1998				1998/1999				1999/2000			
Month	Males	%	Females	%	Males	%	Females	%	Males	%	Females	%
November	35	53	31	47	23	50	23	50	0		0	
December	68	61	43	39	19	63	11	37	0		0	
January	38	73	14	27	36	62	22	38	0		0	
February	0	0	0	0	0	0	0	0	0		0	
Unknown	0	0	0	0	0	0	0	0	0		0	
Total	141	62	88	38	78	58	56	42	0		0	